THE

CYCLOPÆDIA;

OR,

Universal Dictionary

OF

ARTS, SCIENCES, AND LITERATURE.

VOL. IX.
THE

CYCLOPAEDIA;

OR,

UNIVERSAL DICTIONARY

OF

Arts, Sciences, and Literature.

BY


WITH THE ASSISTANCE OF

EMINENT PROFESSIONAL GENTLEMEN.

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BY THE MOST DISTINGUISHED ARTISTS.

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COLLISION, from the Latin Collisio, a breaking, knocking, or dashing together, in Philosophy and in Mechanics, means the meeting, mutual striking, or congress, of two or more bodies, one of which at least is in motion. The collisions of bodies and the results arising from those collisions, form by far the greatest part of the operations of nature, as well as of artificial mechanics; hence the industry of man has spared no pains in the investigation of the laws which regulate those motions, and in the performance of experiments tending to confirm and to illustrate the same. In the theory of collision or percussion, the simplest cases are considered first, and such, indeed, as cannot actually take place in nature; for instance, two bodies are supposed to move equally (that is, each of them, or one at least, to run through equal lengths in equal portions of time) in non-resisting mediums, and those bodies are farther supposed to be either hard, or soft, or elastic. A hard body is that whose parts retain their respective situation or figure in all cases, not yielding to any stroke or percussion. A soft body is that whose parts yield to any stroke, and have no power to recover their original situation; and lastly, an elastic body is that whose parts yield to any stroke, but presently regain their original form and situation. Now, in nature, as far as we know, there are no bodies perfectly elastic or perfectly unelastic; including under the latter name both those that are perfectly hard and those that are perfectly soft. All the bodies we are acquainted with are partially elastic, but in various degrees; nor can their motions take place without meeting with some obstruction. Yet the laws of collision, under the above-mentioned suppositions, being demonstratively deduced from the general laws of motion, which are justly assumed as axioms, determine the phenomena which would take place if those suppositions were real; it being afterwards more easy and practicable to estimate, and to allow for those deviations of practical results from the abstract theory, which arise from the imperfect elasticity of bodies, from resistances of mediums, from friction, &c.

The theory of collision is derived from Sir Isaac Newton's third law of motion, which says, that action and reaction are always equal and contrary to each other. See Laws of Motion.

Definition 1. The respective velocities or celerities of bodies are proportional to the spaces which they describe in a given time. Thus, if a body, A, passes through an extension of 10 feet in one second of time, whilst the body, B, runs through an extension of 100 feet in the same time, then the respective celerities of those bodies are said to be as 10 to 100; or as one to ten.

Def. 2. The bodies are said to strike directly against each other, when in striking, there occurs no reason why they should turn towards one side rather than towards another; so that both before and after the stroke, the motion is in the same straight line, unless it be all destroyed.

Def. 3. In every other case the stroke is said to be oblique. The principal proposition belonging to this theory, considers two bodies that strike directly against each other, and the result is concisely expressed by Sir Isaac Newton in the following words: "the quantity of motion, that is gathered by taking the sum of the motions made towards the same parts, and the difference of those made towards the contrary parts, is not altered by the action of bodies amongst themselves." For the sake of perspicuity we shall endeavour to demonstrate this proposition, by considering the two cases separately.

"Theorem
Theorem I.

If a body, A, (Plate XV. Mechanics, fig. 1.) strike directly against another body, B, which is either at rest, or moving in the same direction, but slower; the sum of the motions in both the bodies towards the same parts, will remain the same after the stroke, as it was before that stroke.

Let CD express the motion of the body A, and EF the motion of the body B; viz. that whilst A moves from C to D, B moves from E to F. Therefore, the sum of the motions is CD plus E F. Now, since it moves with greater velocity than B moves with, it necessarily follows, that A must overtake, and strike against B. And it will appear, that after the stroke the sum of the motions is the same as it was before, viz. CD plus E F. For since action and reaction are equal (3rd law of motion), if A, by striking on B, communicates to it the additional motion FG; it must lose as much itself; viz. DK (equal to FG) must be subtracted from CD. So that after the stroke, CK is the motion of A, and EG that of B; and the sum of those motions is CK plus EG, equal to CD plus E F; for, since FG is equal to DK, add EF and CK to both, and it will be FG + EF + CK equal to KD + CK + EF; viz. EG + CK = CD + EF.

The various cases of this proposition are as follow: If FG is equal to CD, then K and C coincide, and C K vanishes or becomes equal to nothing (as in fig. 2); hence, after the stroke, A will be at rest.

If FG exceeds CD; then K will fall beyond C; and the motion of A will become retrograde or negative (as in fig. 3.) Therefore, the sum of the motions towards the same part is the difference between EG and CK; viz. EG minus CK.

If B falls at rest, then its motion becomes equal to 0, and in that case the sum of the motions is reduced to CD.

Theorem II.

If two bodies, moving towards contrary parts, strike directly against each other, the sum of their motions towards the same parts (which is the difference of their motions towards contrary parts) before and after the stroke, will always remain the same towards the same part.

Let the body, A (fig. 4.), move from C towards D, and let CD represent its motion, whilst the body, B, moves in a contrary direction from E towards F, and let EF represent its motion.

Make DH equal to EF; then C H is the difference of the motions towards the contrary parts, and is, at the same time, the sum of the motions towards the same part; viz. towards G. Now, after the stroke, the same, CH, will be as the sum of the motions towards the same part; viz. towards G.

Let the motion of B, after the stroke, be towards G, and let it be represented by E G. Therefore, the force communicated to B is E F plus E G, that is, FG. But (by the 3rd law of motion) making D K equal to FG, D K will represent the motion lost by A; so that if D K be subtracted from C D, the remainder, C K, will be the motion of A towards G. Now, since D K is equal to FG, and D H is equal to F E; it will be D K minus D H, (viz. K H), equal to FG minus FE (viz. E G). Therefore, since E G is equal to E F, K H will represent the motion of B after the stroke, and C K will represent the motion of A; so that C K plus K H is equal to C H, and is the sum of the motions towards C G.

If F G is equal to C D (as in fig. 5.); then K and C coincide, consequently the motion of A becomes equal to 0.

If G exceeds C D (as in fig. 6.) K will fall beyond C, and the motion of A will be retrograde; but (since F G is equal to D K, and K H to D H) K H will be equal to E G; therefore, taking C K from both, C H will be equal to E G minus C K. But C H was as the sum of the motions towards G before the stroke, and E G minus C K is as the sum of the motions towards the same part; namely, as the difference of the motions towards the contrary parts after the stroke. Therefore, the sum of the motions towards the same part will be the same both before and after the stroke.

Having demonstrated the two simplest theorems belonging to the doctrine of collision, wherein the equality of the motions before and after the stroke has been considered, it is now necessary to examine the direction, the velocity, and the momentum of the bodies after the stroke; and for this purpose the properties of the centre of gravity must be recollected.

But, that property of the centre of gravity, which is more immediately concerned with the present subject, is briefly expressed in the following lines:

If bodies, moving in the same straight line, strike against each other, the state of their common centre of gravity will not thereby be altered; viz. it will either remain at rest, or it will continue to move in the same straight line, exactly as it moved before the stroke. See Center of Gravity.

Theorem III.

Let there be two non claflie bodies (viz. either perfectly hard or perfectly soft); and if one of them move in a straight line, whilst the other is at rest in that line, or is moving in the same direction, but at a slower rate, or is moving in the contrary direction; then those bodies must strike directly against each other, and after the stroke they will either remain at rest, or they will move on together, conjointly with their common centre of gravity. Their momentum, after the stroke, will be equal to the sum of their momentums before the stroke, if they both moved in the same direction; but it will be equal to the difference of their momentums if they moved in contrary directions. Their velocity, after the stroke, will be equal to the quotient that arises from dividing the sum of their momentums, if they both moved the same way, or the difference of their momentums, if they moved contrary ways, by the sum of their quantities of matter.

That, after the stroke, the two bodies must either remain at rest or move on together, is evident; for, since they are not claflie, there exists no power that can effect their separation. With respect to the momentum, it must be observed, that where the bodies meet (by the 3rd law of motion), whatever part of the momentum is lost by one of the bodies, must be acquired by the other; therefore, if before the stroke the bodies moved the same way, their joint momentum, after the stroke, will be equal to the sum of their momentums before the stroke. If one of the bodies was at rest, then, as its momentum is equal to its joint momentum, it will be equal to the momentum of the other body before the meeting. If the bodies moved towards each other, then their momentum, after the meeting, will be equal to the difference of their former momentums; and if in this case their momentums are equal, then their difference vanishes; that is, the bodies will remain at rest after their meeting.

The last part of the theorem is evident; for the momentum of a body in motion is equal to the product of the velocity multiplied by the quantity of matter. See Momentum.
The weights and velocities of the two bodies before their meeting being given, the velocity, after the meeting, may be determined by the following method, which is applicable to the four cases of Figs. 7, 8, 9, and 10. Let A and B be the two bodies, C their common centre of gravity, and D the place of their meeting. Make DE equal to DC, so that the point, D, may be between C and E; then DE will represent the velocity after their meeting; for, since the bodies, after their meeting, move together conjointly with their common centre of gravity; and the centre of gravity has the property mentioned immediately before the third theorem; it follows that the velocity of their common centre of gravity after their meeting, must be equal to its velocity before the meeting; viz. DE must be equal to CD, and is the same as the velocity of the two bodies after the meeting, because, then, they move together with the centre of gravity.

Fig. 7. shows when the bodies move the same way. Fig. 8. shows the body, B, at rest before the stroke, in which case B and D coincide. In Fig. 9, the two bodies move towards each other; and Fig. 10, shows the two bodies moving towards each other with equal momentums, in which case they will remain at rest after the meeting. In all those four figures, the respective velocities of the bodies are represented by AD and BD, and A B is their difference. The respective momentums are represented by the product of the weight of A multiplied by AD, and of the weight of B multiplied by BD. The momentum after the meeting is represented by the weights of both the bodies multiplied by DE.

Example of the computation of the first case, Fig. 7. — Let A weigh 10 lb. and move at the rate of 4 feet per minute. Let B weigh 6 lb., and move at the rate of 2 feet per minute, and let the distance AB be 32 feet. The centre of gravity is found by saying 10 : 32 : 10 : BC = \(\frac{32 \times 10}{10}\) = 32 feet; hence AC = 12 feet. Put BD = x, and AD will be equal to 32 + x. Then the time employed by A in moving from A to D, is equal to the quotient of the space, \(32 + x\), divided by its velocity; viz. \(\frac{32 + x}{4}\). And the time employed by B in moving from B to D, is equal to the quotient of the space, x, divided by the velocity of B, viz. \(\frac{x}{2}\). But, since the bodies meet at D, those times must be equal; that is, \(\frac{32 + x}{4} = \frac{x}{2}\); and by the resolution of this simple equation, we have \(64 + 2x = 4x\); and \(x = 32 = BD\).

Then DE = DB + BC = 32 + 20 = 52 feet; viz. after the meeting, the two bodies will move from D to E, which are 52 feet apart, in as much time as each of them employed in going to D; viz. 16 minutes. Therefore, in order to find how many feet per minute the bodies will run over after the meeting, divide 52 by 16, and the quotient, \(\frac{52}{16}\) is the answer.

The magnitude or quantity of the stroke is deduced from the third general law of motion, and from the nature of the momentum of a body in motion, which is equal to the product of the quantity of matter, or weight of the body, multiplied by the velocity, consequently in the same body the momentum is proportionate to the velocity. The particulars relative to the magnitude of the stroke, are expressed in the following theorem.

**Theorem IV.**

If a body in motion strike directly against another body, the magnitude of the stroke is proportional to the momentum lost, at the concourse, by the more powerful body. Also, when the latter body is at rest, the quantity of the stroke is proportional to the velocity of the former body. — If the second body be moving in the same direction with the first, but at a slower rate, the magnitude of the stroke will be the same as if the second body stood still, and the first impinged upon it with a velocity equal to the difference of their velocities. — And, lastly, if the bodies move directly towards each other, the magnitude of the stroke is the same as if one of the bodies stood at rest, and the other struck it with the sum of their velocities.

Thus much may suffice with respect to the collision of non-elastic bodies. It is now necessary to state the particulars belonging to the collision of elastic bodies; viz. of those whose parts yield to any impression, but frequently recover their situation, by-re-acting the contrary way with a force, which, in bodies perfectly elastic, is equal to the impression or stroke received. There are innumerable degrees of elasticity. See Elasticity.

**Theorem V.**

When two bodies, that are perfect elastic, strike directly against each other, their relative velocity (by which is meant the excess whereby the velocity of the lighter body exceeds that of the flower) will be the same before and after the stroke; viz. they will recede from each other with the same velocity with which they approached before the stroke.

The magnitude of the stroke (Theor. IV.) is proportional to the respective velocities. And in bodies that are perfectly elastic, the restoring force is equal to the compressing one; therefore, if the momentums of the bodies produced a certain compression, the elastic force must re-act on the bodies with equal power; hence the bodies will be forced to recede from each other with the same velocity with which they approached each other.

From what has been stated above, the results arising from the collisions of bodies that are perfectly elastic, may be easily deduced in all the variety of cases in which the two bodies may be conceived to meet. The particulars upon which those results more immediately depend, are, first, that the distances of two bodies from their common centre of gravity are inversely as their weights; (see Center of Gravity and its properties); secondly, that the rate or uniform motion of the centre of gravity of bodies is not altered by the mutual action of those bodies on each other; thirdly, that in bodies that are perfectly elastic, the restoring is equal to the compressing force; and fourthly, that the distances of the bodies from each other, and from their common centre of gravity, are equal in equal times taken before and after the stroke; for in those two cases they move with equal velocities.

All the cases of direct collision of two perfectly elastic bodies are delineated in the figures 11, 12, 13, 14, 15, 16, 17, 18, and 19, in which A and B represent the two bodies; C is their common centre of gravity; D the place where they meet. A D expresses the velocity of A, A B the velocity of B and C D that of the centre of gravity. Hence by inspecting the figures it will be easily discerned when both the bodies are in motion, or one of them is at rest; also their directions, &c. Then the rule for determining the velocities after the stroke is as follows: — Take a point E in the line A B, produced if necessary, so that the distance C E be equal to C D; then, after the stroke, the right line E A will express
express the velocity of the body A from E towards A, and the right line E B will express the velocity of B from E towards B.

In fig. 11, B is larger than A, (which is plainly indicated by the situation of the centre of gravity C), B is at rest, and A strikes against it. In this case, after the stroke, both the bodies will recede from the point D, with the velocities E A and E B.

In fig. 12, A, the larger body, runs against the body B, which is at rest. In fig. 13, the body A is larger than B, and they are both in motion the same way. In fig. 14, A is less than B; the rest in the preceding case. In fig. 15, A and B meet at D, where A remains at rest. In fig. 16, A and B are equal, and after the stroke they recede with interchanged velocities. In fig. 17, the bodies are proportional to their velocities; hence the points C, F, D, and E, coincide. In fig. 18, A remains stationary at the place of congress D. Lastly, in fig. 19, though the bodies A and B meet at D between the points A and B, yet after the stroke they both move towards F.

The numerical computation of these cases may be easily comprehended by the following example, which is adapted to the case of fig. 13.

A and B are two elastic bodies. A weighs 2 lb., and moves at the rate of 8 feet per second. B weighs 8 lb., and moves the same way at the rate of 5 feet per second. The distance A B is 12 feet.

1. To find the place of the centre of gravity C, we have A + B = B + A; C = A; and C = C = C = C = 4, a, d CB = AB - AC = 8.

2. To find the distance BD, put BD = x; and since the distances A D and B D are run over in the same time, the former at the rate of 8, and the latter at the rate of 5 feet per second; therefore we have \( x = \frac{8}{8} + 12 = \frac{5}{8} + 60; \) and \( x = 50 \) B D.

3. If the distance B D; viz. 20, be divided by the velocity of B (viz. by 5); the quotient \( q \) is the number of seconds, during which the bodies moved from their respective places A and B, to the place of their congresses D.

4. EC = CD = CB + BD = 8 + 20 = 28; and EA = EC - AC = 28 - 4 = 24; which being divided by 4 (the number of seconds found above) gives 6 for the velocity of A after the stroke, in the direction from E towards A. Also EB = EC + CB = 28 + 8 = 36; which being divided by 4 (the number of seconds, &c.) gives 9 for the velocity of B after the stroke in the direction from E towards B. So that after the stroke, the bodies A and B will both continue to move the same way, but the former at the rate of 6, and the latter at the rate of 9 feet per second.

It is now necessary to apply the above theory to those cases which really occur in nature, and in the first, since all known bodies are partially elastic, we must shew how to eliminate the results of the collision of such bodies. Thus, let A and B, figs. 20 and 21, be two bodies impinging on each other, as C their common centre of gravity; and D the place of their meeting. Divide AC in a, so that AC may be to AC, as the force compressing the body A, is to the force whereby it strikes C. Also divide BC in b, so that BC may be to BC, as the force compressing the body B is to the force whereby it strikes itself. Take C E equal to C D; then the right line E A will express the velocity of A after the stroke in the direction from E towards a, and the right line E B will express the velocity of B in the direction from E towards D.

In the foregoing paragraphs the distances have been reckoned from the centres of the bodies; but since the bodies must strike with their surfaces, and not with the centres, therefore, when great accuracy is required, the thickness of the bodies must be deducted from the distances. However, when the distances are considerable, and the sizes of the bodies proportionately very small, it is immaterial whether the distances be reckoned from the centres or from the surfaces of the bodies; the difference becoming insignificant.

When more than two bodies move in the same straight line, the computation of the velocity of each body after the various strikes cannot be expressed under any general rules; the variety of cases being too great, and often very intricate: yet when any particular case presents itself, the preceding rules will be found sufficient to determine the particulars; offering to apply the computation to the two bodies which, from the circumstances of the case, appear to strike first, then to one of those, and the next, and so on. But sometimes the equality of the bodies, their being contiguous to each other, and other favourable particulars, render the calculation pretty easy and obvious. Thus, if any number of equal and perfectly elastic bodies lie at rest, contiguous to each other, in the same right line, and another body, equal to one of them, strike the first of them in the same right line, with any velocity; then after the stroke the striking body and all the rest will remain motionless, and the last body only will move with the velocity of the striking body.

If the movements, instead of being equal, as we have hitherto supposed, be either accelerated or retarded, the momentum for each small portion of time, must be reckoned such as belongs to the velocity acquired at that particular moment. In curvilinear movements, the direction of the motion in each point is the same as that of the tangent to the curve at that point. Lastly, if the movements, either accelerated or retarded, be likewise curvilinear (as in the vibration of pendulums); the momentum for each given point must be deduced from the degree of acceleration and from the direction of the tangent, at that particular point. Hitherto we have considered the collision of bodies, which strike directly against each other; that is, in a direction perpendicular to their surfaces, and in the direction of their centres. It is now necessary to apply the theory to oblique collisions; and for which purpose the doctrine of the composition and resolution of forces, or of movements, is already known.

See Composition and resolution of Forces.

Theorem VI.

If a body, perfectly elastic, as A, fig. 22, strike obliquely on C on the firm obstacle B, F, then, after the stroke, this body will be reflected from that obstacle in the direction C E, equal to the angle of incidence A C B.

The oblique forces, A C, B F, being resolved into two forces, viz. D C perpendicular to the oblique, and A D parallel to it; the effect on the plane is the same as if the body had advanced towards it directly from D, and (according to the laws already stated) the body A, after the stroke, would be found in the direction A D. But if the body were to enter into which the original force of A was resolved, this body retains the one represented by A D, since this force was not concerned in striking the obstacle; therefore, after the stroke, the body, A, is actuated by two forces, viz. one represented by D C, equal to A B, equal to E F; and the other represented by E F, equal to D A, equal to D E; hence it must move in the diagonal C E; and since the lines C F, 1.
The forces at B, the force B N is retained by it, whilst the force N D is exerted against the other body. Therefore, the actions of those bodies upon each other is exactly the same as if they moved directly from M and the other from N; hence, the above stated rules of direct collision, will serve to find out whether the bodies, after the stroke, will proceed both the same way, or different ways, and at what rate. But when their velocities have been thus determined; for instance, if it be found, that had the bodies moved directly from M and N after the stroke, the body, A, would have moved as far as O, whilst the body, B, would have moved as far as G; then it must be recollected, that, in the present case of oblique collision, the body, A, has retained the force A M; therefore, after the stroke, the body, A, is actuated by two forces, viz., one equal and parallel to A M, and another which is equal and parallel to C O, in conformance of which this body must run a compound course, which is found thus: Through the centre, G, draw C E equal and parallel to A M; through I, draw I E equal and parallel to C O; then the diagonal C E exhibits the velocity and the direction of the body, A, after the oblique concourse. With respect to the body, B, it has been laid, that at the concourse this body retains the force B N, and that, if the bodies had moved directly towards each other, B would, after the stroke, have moved from D to G. Therefore, through D draw D H equal and parallel to B N, and through H draw H F equal and parallel to D G; and, lastly, the diagonal, D F, will represent the velocity and the direction of the body, B, after the oblique concourse.

If the bodies be perfectly elastic, then suppose it to be found (by the rules for elastic bodies) that, after the supposed direct concourse, the body, A, would have been sent back to Q, in the same time that B would have been sent back to R; it follows, that, after the oblique stroke, the body, A, will be actuated by two forces, viz., one equal and parallel to A M, and the other equal and parallel to C Q; the body, B, will likewise be actuated by two forces, viz., one equal and parallel to B N, and the other equal and parallel to D R; therefore, in fig. 24, draw Q Z through Q, equal and parallel to A M; also through Z draw I Z equal and parallel to C Q; then the diagonal, C Z, represents the velocity and the direction of the elastic body, A, after the oblique stroke.—Again, through R draw the line, R X, equal and parallel to B N, and through X draw the line, X Y, equal and parallel to D R, then the diagonal, D X, will represent the velocity and the direction of the elastic body, B, after the oblique stroke.

Amongst all the cases of collision, we have hitherto omitted to mention the striking of a body upon an immoveable obstacle. This has been done merely because the particulars belonging to it may be easily derived from the consideration of the foregoing cases; it being only necessary to consider this case as if it were that of the collision of two bodies, either elastic or non-elastic, or partially so, and to suppose that one of the bodies, which represents the immoveable obstacle, is infinitely great. There is a difference between the stroke of an elastic body, and that of a non-elastic one, which, not being very obvious, deserves to be mentioned. This is, that the effect of the blow of an elastic body upon another body, as upon a plane, is double to that of a non-elastic body, their masses and velocities being equal. This arises from the elasticity of the former, which, after the stroke, by endeavouring to recover its original figure, acts upon the plane with a force equal to the first motion; whereas a non-elastic body acts only with the first impression. See the article Percussion. Also, if the reader with to see the original investigation of the laws belonging to the collision of bodies, together with any analytical and experimental illustration of the same, he may peruse Dr. Wallis's paper in the Phil. Trans. No. 43; M. Huygens's paper, Phil. Trans. No. 45; Sir Christ. Wren's paper, Phil. Trans. No. 45; Gravæeland's Mat. Elem. of Nat. Phil. edited by D'Aubignier; Gregory's Mechanics, vol. i. chap. v.; and all the best works on mechanics.

COLLIUS, Peter, in Biography, of the college of Milan, flourished in the beginning of the seventeenth century, and was the author of a curious treatise entitled "De Animatibus Paganorum," printed at Milan in two vols, 4to, in the year 1622-3. In this work he decides without hesitation on the future happiness or misery of many virtuous and truly illustrious characters of the Pagan world. His conclusions were founded on conjectures, deduced from a comparative view of their means of divine knowledge, their lives and manners, their opinions and writings, united with the testimony of faith and profane history. He published also a treatise "De Sanguine Christi," and a quarteto volume entitled "Conclusions Theologicae." In them all is a great display of sagacity, accompanied with a good share of talents. Novv. Dict. Hist.

COLLIWILY, in Geography, a town of the island of Ceylon; 50 miles W. of Trincomalee.

COLLUMEN, or CULMEN, a town of Germany, in the circle of Upper Saxony, and circle of Leipzig; 6 miles E.N.E. of Merseben.

COLOBRIERES, a town of France, in the department of the Var, and chief place of a canton, in the district of Toulon; 18 miles N.E. of Toulon. The place contains 1509, and the census 2933 inhabitants; the territory includes 3234 kilometres, and two communies.

COLOCCUS, in Botany, Sloan. See Cordia Colloboca.

COLLON, in Geography, a post and fair town of the county of Louth, Ireland, which is neat and well built; and which has improved considerably under the auspices of the late lord chief baron Bolton, and his son the right honourable John Bolton, the much respected speaker of the Irish house of
of commons, when the union took place. It is 29Irish
miles N. from Dublin.

COLLONCE, a town of France, in the department of
Lampt, and chief place of a canton, in the district of
Geneve; the place contains 1175, and the canton 8347 in-
habitants; the territory comprehends 215½ square
and nine communes.

COLLOPS, in Ancient Geography, an appellation diiin-
guishing two towns of Africa; the one called “Collops
Parva,” appears to have been the same with Colliulian,
situate F. of the Sinus Numidicus; the other, called “Collops
Magna,” was, according to Ptolomy, the same with Colula,
and situated N.W. of the same gulf.

COLLOQUIA, in Ecclesiastical History, a name given
in Switzerland to assemblies of the pontifical Grion clergy.
Each league is divided into a certain number of districtis,
the ministers of which assemble twice every year; and these
assemblies are called colloquia. Each colloquium has its pre-
sident, and each league a superintendent, called a dean.
The supreme authority in spiritual concerns is vested in the synod,
which is composed of the three deans, and the clergy of each
league; the synod assembles every year alternately in each of the three leagues. Candidates for holy orders are
examined before the synod. The necessary qualification for admission into the church, ought to be the knowledge of
Hebrew, Greek, and Latin; but many are ordained without
the least acquaintance with either of these languages.
Formerly Latin was freely used, as well in the debates of the
synod, as for the purpose of examining the candidates;
but at present that tongue is more and more disused, and
German is employed in its stead. See GISONS.

COLLOQUIUM, in Law, (a colloquendo), a talking
together, or affirming of a thing, laid in declarations for
words in actions of slander, &c.

COLLUCIANISTÆ, in Church History, a denomination
given to the Arians, from the martyr Lucian, a presbytery
of Antioch.

COLLUM, in Anatomy. See Neck, and Cervix.

COLLURIO, in Ornithology, the name given by Brissin
to the Lanius Collurio of the Linnean Fauna Suecia;
red backed shrive of English writers.

COLLURIO madagascariensis, of Briffon, the hook-billed
shrike, laniscurvirostris.

COLLUSION, a secret understanding between two
parties, who plead, or proceed, fraudulently, each the other,
the prejudice of a third. This collusion is either
apparent, when it shows itself on the face of the act; or more
commonly, it is secret and artfully concealed by a show of
honesty. This is a practice which the law abhors; and,
therefore, when detected, it makes void all things dependent
upon it, though otherwise in themselves good. Co. Litt.
120, 260. Plowd. 54. Collusion may sometimes be tried
in the same action, wherein the covin is, and sometimes
in another action, as for lands aliened in mortmain by a quale
just in; and where it is apparent, the proof of it is unnecessary;
but when it is secret, it must be proved by witnesses, and
found by a jury like other matters of fact. 9 Rep. 33.
The statute of Westminster 2, 13 Ed. I. c. 33. gives the writ
guale just, and inquiry in these cases; and there are several
other statutes relating to deeds, made by collusion and
fraud. The cases particularly mentioned by the statute of
Westminster 2. are of quale impedit, affije, &c. which one
company brings against another, with intent to recover the
land or advowson, for which the writ is brought, held in
mortmain, &c. See FRAUD.

In the canon law, collusion, in matters of benefices, va-
cates the benefice, and incapacitates the person from holding
any benefice at all.

COLLUTHIANS, in Ecclesiastical History, a religious
sect, which rose about the beginning of the fourth century;
and occasion of the indulgence shown to Arius by Alexander,
patriarch of Alexandria.

Several people being scandalized at so much condensation;
and, among the rest, Colluthus, a priest of the same
city; he hence took a pretence for holding separate assem-
bles, and by degrees proceeded to the ordination of priests,
as if he had been a bishop; pretending a necessity for this
authority, in order to oppose Arius. To his fehlm he
added hereby; teaching, that God did not create the wick-
ed; that he was not author of the evils that befal men,
&c. He was condemned by a council held at Alexandria by
Osiris, in the year 350.

COLLUTHUS, in Biography, a presbyter of Alexandria,
was founder of the temporary Christian sect, at the
beginning of the fourth century, above-mentioned. By
the decrees of the council held by Osiris, Colluthus was de-
posed of the episcopal honours with which he had invested
himself, and the prebends whom he had ordained were
degraded. Colluthus submitted to the decree, and returned
quietly to the duties of his office as a parochial presbyter;
his followers likewise re-united themselves to the orthodox

COLLUTION, Collatio, in Medical Writings, is sometimes
used for the washing of the mouth, particularly, when
done to clean or soften bad or loose teeth; or free the gums,
&c. from ulcers.

COLLVIES, a term which Calcutt and other writers
on the universal deluge have applied to the fluid mafs,
into which, according to their opinion, the flrata of the antedilui-
union earth were dissolved, and their constituent corpuscles se-
parated. See DELUGE.

COLLYBUS, κολλυβος, in Antiquity, the name with what
is now called the rate of exchange.

COLLYRÆ, or COLLYRIDES, a certain ornament
of hair, worn by women on their necks. It was made
up in the form of the small, roundish, cakes, called κολλυρία, or
collvre.

COLLYRIDIANIS, in Church History, a sect, towards
the close of the fourth century, denominated from a little cake,
called by the Greeks κολλυρία, κολλυρίδα, which they offered
to the Virgin Mary.

This sect, it seems, consisted chiefly of Arabian women,
who brought it from Thrace to Arabia, and who, out of
an extravagance of devotion to the Virgin, met on a certain day in the year, to celebrate a solemn feast, and
to render divine honours to Mary as to a goddess; eating
the cake which they offered in her name. St. Epiphanius, who
relates the history of this superstitious ceremony, ridicules it.
They sprung up in opposition to the Antidio-Maroni-
ites.

COLLYRIUM, κολλυριον. This term was formerly
applied to any medicament, solid, or liquet, employed to
restrain defluxions; but it is now entirely confined to wet
applications, topically applied for this purpose in complaints of
the eyes.

COLLYRIUM is also a name given to unguents used for
the same purpose; as unguent of totty, and several others.

COLLYRIUM is also a denomination given, though improperly,
to some liquid medicines used against venereal ulcers.

COLLYRIUM Sanium. See SAMIA TERRA.

COLLY-WESTON Slate, a whftish kind of micaceous
grit
grit stone, which splits into very thin lamina, and is much used for lining buildings in the eastern and some of the midland counties of England; it is the produce of a stratum situated not far in the series from the Calcite or Ketton stone, so well known to builders. In this stratum, particularly near Stonesfield, in Oxfordshire, bones of animals of some unknown kind are frequently found lodged. See Slate.

COLM, in Geography, a small island of Scotland, in the Firth of Forth, six miles S.E. of Dunfermline.

COLMAN, George, in Biography, an English writer, was the son of Mr. Thomas Colman, British resident at the court of the duke of Tuscany. He was born at Florence about the year 1733. He received his school education at Wollminster; and was entered as a student at Christ-church, Oxford, where he engaged with Bonnel Thornton, in writing "the Connoisseur," a periodical of considerable merit, which was afterwards published in four volumes, 12mo. This work is remarkable for the humorous delineations of the manners of the age, and displays classical reading and taste. On leaving the university he entered at Lincoln's Inn, and was in due course called to the bar, but never followed his profession. In 1760, he produced two dramatic pieces which were received with great success, the first was entitled "Polly Honeycombe," and the other "the Jealous Wife;" this last still keeps its place on the stage. In 1764, Lord Bath died and left Mr. Colman a handsome annuity, which was increased on the death of general Putteney, in the year 1767. In conjunction with Garrick, he brought out the "Clandestine Marriage," a comedy of great merit, and which maintains an undiminished reputation. In 1768, he purchased a share of the Covent Garden theatre; this, however, he soon disposed of, and purchased Mr. Fout's theatre in the Haymarket, which he held till his death in 1794, though he had for the four preceding years been incapable of any business, owing to a paralytic stroke with which he was seized in 1789, and which affected his understanding in such a manner as to bring on derangement and idiocy. Mr. Colman translated Terence's plays into a sort of blank verse: also "Horace's Art of Poetry," which added to his reputation as a classical scholar. In 1787, he collected, in three small volumes, a variety of pieces which he had published at different times, under the title of "Verse on several occasions, accompanied with some pieces of verse." Gen. Bosc.

COLMAR, in Geography, a town of Germany, in the duchy of Holstein, five miles S.E. of Gluckstadt.

COLMAR, a large and well built town of France, and capital of the department of the Upper Rhine, seated on the river Fecht, and surrounded by a wall, flanked with towers. It has a fair and four courts of justice. The town contains 13,756, and the canton 14,429 inhabitants; the territory includes 55 kilometres, and two communes: 104 leagues N. of Bâle. The principal trade of the inhabitants of Colmar, who are said to be very industrious, is in corn, wine; and their chief manufactures are those of woollen cloth, calico prints, stockings, hardware, and gun-powder. The district consists of 142 communes or townships, distributed into 13 cantons, and comprehending a population of 144,821 inhabitants. Its whole territory includes 1680 kilometres. It has silver, copper, lead, antimony, arsenic, and beautiful crystalline mines; and also a manufacture of gold and lace. N. lat. 48° 44'. E. long. 7° 23' 11".

COLMARS, a town of France, in the department of the Lower Alps, and chief place of a canton, in the district of Caflillane; 22 miles N. of it. The place contains 898, and the canton 3585 inhabitants; the territory includes 285 kilometres and five communes.

COLMBERG, or Kolnemberg, a town of Germany, in the circle of Franconia, and principality of Anspach; 9 miles N.W. of it.

COLME, L.A., a river of France, branching from the river, Aa, at Watte, in the department of the Straits of Calais.

COLMENAR, a town of Spain, in Old Castile, on the confines of New Castile, 7 leagues N.W. of Talavera de la Reina.—Alfa, a town of Spain in New Castile, five leagues N.E. of Fucshis.

COLMITZ, a town of Germany, in the archduchy of Austria, four miles S.S.W. of Droffendorf.

COLMORTH, a rectory in the county of Bedford, and hundred of Bartord: the lofty spire of its breast forms a very conspicuous object to the surrounding country. In the Government Trigonometrical Survey in 1799, its situation was determined by observations from Lillby-Hoe elevation, distant 57 617 feet, and bearing 0° 12' 52" S.E. from the parallel to the meridian of Greenwich; and from Liddington elevation 75 914 feet; whence is deduced its latitude 52° 12' 49.5' N. and its longitude 22° 27', or 12° 29.4' W. of Greenwich.

COL.N., a river of England, which passes by Uxbridge and Colnbrook, and runs into the Thames, near Staines, separating the county of Middlesex from Buckinghamshire. The clearness and purity of the water of this river, inflowing almost entirely in springs out of the chalk hills of Hertfordshire, have always been proverbial. This circumstance probably occasioned the cutting, at some distant periods, of two channels many miles in length, for diverting part of its waters across Howllow-heath to Twickenham, and into Ditchie-park; and a very principal part of the design of the Paddington branch of the Grand Junction Canal, in latter times, was for diverting part of its limpid streams, in order to supply the metropolis with water, to which purpose it is admirably adapted.

COLN., a river of Essex, which is navigable from the mouth of the Thames at Mersey island up to the town of Colchester. See Canal.

COLN., a river which runs into the Thames at Cricklade.

COLN.BROOK, a town of England, in the county of Bucks, on the river Coln, with a weekly market on Wednesday, three miles E. of Windfor, and 17 W. from London.

COLNE, a considerable market-town of Lancashire, England, is advantageously situated on a dry and elevated ridge. This place, says Dr. Whitaker, "is unquestionably the colne of the anonymous Ravennas, and was probably never abandoned entirely, in the long and obscure period of Saxon history." At this place, there have been several Roman coins, and other antiquities found. The church is a spacious structure, and appears to have been "refored about the time of Henry VII or VIII." Here are a market on Wednesdays, and two annual fairs. Colne is 218 miles N. of London, and contains 782 houses, with 3026 inhabitants. This town is situated in the hundred of Blackburn, near to the grand ridge on its western side, and also to the Leeds and Liverpool canal, and to the famous Forth-tunnel upon it. It was once an object of contemplation to construct a branch of the Rochdale canal to this town; but it was never accomplished. Whitaker's History of Whalley, 4to. See Canal.

COLNUD, de Cayanne, of Buffon, in Crustology, the bare-necked crow, corvus nudus.

COLOMBAUDE, the name given by Buffon to matailla atricapilla, or black cap.

COLO, in Geography, a town of Poland, in the palatinate of Kaliceh, 20 miles N. of Kaliceh.

COLO, in Ancient Geography, a Roman colony, near the city...
city of Constanza, in the kingdom of Algiers, in Africa: the ruins of it now remain, having a castle on a very high rock towards the sea coast, with a garrison, under the command of an aga, under the protection of which is a small French factory, that deals with the Moors for hides, wax, and wool. The mountains of Col, around with a large and fierce kind of monkeys, which the Moors have the art of catching with great facility.

COLOBI, a people of Africa, placed by Ptolemy in the Troglytine region.

COLOBIUM, a region, from which, I suppose, among the Arabs, an upper garment, without sleeves, longer than the tunic.

COLEOMA, in Medical Writings, is used for the pre-terminary growing together of the lips, or eyelids, or for the adhesion of the ears to the head.

COLEONOMRON, in Ancient Geography, a promontory of Ethiopia, near Egypt, placed by Strabo and Ptolemy in the Archil gulf.

COLEOBA, a town of Spain, in Bética, placed by Piny in the district of Hipparia; now Triabena.

COLEBRASUS, a town of Asia, situate in the interior part of Cilicia Montana, which, according to Ptolemy, was a country of Pamphylia.

COLOCASIA, in Botany, Cl. See Arum Colocasia.

COLOCASITES, in Ancient Geography, an island of the Red sea, on the coasts of Arabia, a country of Ethiopia, according to Piny.

COLOCOLO, in Ornithology, a name given by the people of the Philippine islands, to a bird called also there affili, and by some authors the water raven, corvus fluviatilis. This bird, as it is described in the Philosophical Transactions (n. 285), is of the shape of a common raven, but is truly an amphibious bird, living more of its time under water than in the air; it is black in colour; its neck is remarkably long, and it feeds on fish, which it hunts under water, as they do on land; it feeds likewise on frogs, serpents, and shell-fish. It is common to see it under water in clear rivers, where it seems perfectly at ease, and runs about with great swiftness; at times it comes up to the surface, and dries its wings in the air and sunshine. It is understood by naturalists pretty generally, that the colocolo of the Philippines is not other than the common corvus, pelecanus cor- ba, a bird known to inhabit most parts of the world, and to delight especially in maritime situations, or in marshes, and other watery places, near the sea-coast.

COLOCYNTHIS, COLOQUINTA, Bitter Apple, in the Materia Medica. The colocynthis is a species of gourd (cucumis colocynthis, Linn.) brought from Aleppo and Cyprus, of a globular shape, about the size of the fig, white, smooth, of a fungous texture, divided internally into large cells, which contain a number of oblong seeds. The pulp, which is the part used medicinally, is intensely bitter, nauseous, and astringent. It contains a remarkably large portion of mucilage so as to render slimy a considerable quantity of water when boiled with it; and, on this account too, the spiritsuous tincture is too thick to pass through a paper filter.

The colocynthis, taken in substance, without any mixture or preparation, is one of the most violent purgatives that we are acquainted with, producing, when in a large dose (that is, when more than eight or ten grains), very severe griping pains, and often a discharge of blood, and leaving for some days intervals resembling those of dysentery. It is said, too, to act upon the bowels when applied externally to the abdomen.

The activity of the colocynthis renders it a valuable medi-
C O L

Cologne, in Geography, an arch-bishopal electorate of Germany, in the circle of the Lower Rhine. divided into several districts by other electates, and deriving its name from the city of Cologne. It was a bishopric in the year 343, and, in 799, was erected into an archbishopric by Charlemagne. In the ancient constitution of Germany, the archbishop was the actual head of the Holy See, and arch-chancellor of the sacred empire for Italy. He gave his vote after the elector of Treves, and sat at the right hand of the emperor, at assemblies held in his own diocese, in Gaul, or in Italy. The metropolitan church and chapter, which is composed of 25 canons, and 36 dignitaries, are at Cologne. Since the French revolution, and the subsequent arrangement of its territories, Cologne is a district of Roer, or Ruhr, comprehending 10 cantons, viz. Cologne, Bergheim, Brühl, Dormagen, Eifel, Juliers, Kerpen, Lechbach, Wayden, Zulpich, which include 294 communes, 1757 kilometers, and 357,215 inhabitants. Although this electorate is reckoned one of the most fertile countries of Europe, the bigotry, ignorance, and idlenes of its inhabitants, who are mostly Roman Catholics, prevent its deriving those advantages from its productions, and particularly its commerce, which might reasonably be expected.

Cologne, the capital of the archbishopric above mentioned, and formerly one of the free and imperial cities of Germany, in the circle of Welphania. It was taken possession of by the French in 1794, and is now the capital of the district that bears its name in the French department of Roer, and is said to contain 38,344 inhabitants. Cologne is situated, in the form of a crescent, on the banks of the Rhine, and fortified in the ancient manner; but its walls are in so decayed and tottering a state, that they are incapable of affording it any defence. The whole of its length, along the river, is about 32 miles, two-thirds of which space is uninhabited; several of the squares and streets more resembling a field, or an uncultivated garden, than parts of an inhabited city. In traversing its environs one may observe more than 150 miserable farm-houses, with gardens, which furnish the city with all sorts of greens, butter, cheese, milk, &c. The streets are narrow, winding, and gloomy, and most of the houses are very high, old, and ruinous; and yet this city is said to contain, within its comports, more churches, chapels, and monasteries, than there are days in the year. The Roman Catholic university scarcely merits the appellation. The number of beggars that disgrace its police is very great, and it is said, that the propriety to idlenes, glutonry, and begging, which prevails throughout the city and adjacent country, is encouraged and encouraged by the example of the different orders of monks; whose chief object is to keep the people, who, with the exception of a few Protestant families, are Roman Catholics, in a state of ignorance and superstition. Two thirds of the inhabitants are either professed beggars, or con-fidiants. The other third consists of a few patricians, mechanics, and mechanics, on the produce of whose excursions and industry the red wine.

Cologne, upon the whole, is at least two centuries behind the other parts of Germany, with regard to improvement in the arts and sciences. Although no city in Germany is more favourably situated for commerce, the natural bigotry and idleness of the inhabitants lead them to forego the benefits which their situation awards them; and their trade has dwindled away to the manufacture of a few ribbons, stockings, lace, and tobacco. The vessels that may be always seen in the port of Cologne are very numerous; the quay, more than 18 mile long, is continually crowded with ships; but the goods on board are almost wholly the property of foreign merchants. About a fortnight before the fair at Frankfort begins, there is a great concourse of these merchants at Cologne, who repair daily from thence to Frankfort, by means of two commodious vessels containing from 150 to 200 passengers, every other day during the fair. The Jews were expelled from Cologne in the year 1485, and from that remote period not one of them has ever obtained leave to settle there, or dared even to enter the city without permission of the magistracy. Under the old police, if a Jew came into the city, he was accompanied by a guard during his stay, and obliged to pay a duty for every hour of his continuance there. In the year 1618, the Protestants were all expelled, but some years after they obtained permission to return. The magistrates indeed gave them leave to erect a place of worship, which was destroyed by the infuriated mob as soon as it was finished. Since that event they have erected for themselves several handsome churches at Milheim, three miles from Cologne, on the right bank of the Rhine. The trifling commerce of Cologne has been confined to a few Protestant families ever since the period of their return, who, it is observed, are the only opulent inhabitants of the place. The wealth of the churches at Cologne, at least before it was taken possession of by its new occupiers, was immense, particularly that of the cathedral. These churches are repositories of various relics that are held in high estimation by the superstitious Catholics. The theatre is a roomy building, but not elegant. The town-houses are irregular edifices, awkward and a ruinous state. The arsenal occasions part of a very narrow street; its contents are chiefly ancient arms, not proper for modern use; and the building itself is in a state of decay. The dealers of Nuremberg and Augsburg bring their toys in large quantities to Cologne for exportation to Holland, England, and America. The Spaniards and Portuguese carry on a very profitable trade with them in both the Indies. The inhabitants of Cologne derive a very considerable advantage from the importation of coals out of the adjacent countries of Berg, the electorate of Treves, the principalities of Saarbruck, and duchy of Luxemburg, which come by the Saar down the Moselle and the Rhine, and supply the want of wood fuel, that is very scarce about Cologne. Some of these coals are round and large, and another sort consists of dust, which is mixed with clay and water, and formed into small cakes, manufactured in summer; and which, being gradually hardened by the heat of the sun, are stored up in large magazines erected for that purpose. These coal-cakes are sold at 10 livres (about 1/2 English money) per hundred; and it is said, that 100 of them will go as far as three bushels. Near this city some pseudo-volcanic remains have been traced, which are thought to be such as are mentioned by Tacitus at the close of the 13th book of his Annals, the effects of an eruption which ravaged the country of the Juoves, N. lat. 50° 55' 21". E. long. 6° 52'.

Cologne, a town of France, in the department of Gers, and chief place of a canton, in the district of Lombe; 8 leagues E. of Auch. The place contains 769, and the canton 6096 inhabitants; the territory comprehends 1175 kilometers, and 17 communes.

Cologne Earth, a substance used in painting, as a water colour, much approaching to amber in its structure, and of a deep brown. It has generally been esteemed a genuine earth, but has been discovered to contain a great deal of vegetable matter, and, indeed, it is a very singular substance.

It never constitutes an entire stratum in the earth, but is lodged among other strata in large flat detached masses. It is moderately dry, while in the earth, and of a soft crumbly
crumbly texture. When dried, it is of a deep, dusky brown, of a very close, compact, and fine texture, and very remarkably light; it is of a smooth, even surface, dry, but not hard to the touch, crumbles easily to pieces between the fingers, and slightly stains the hands: it adheres firmly to the tongue, but not at all resembling the allergicity of the bones, or any thing else of the mineral kingdom, but plainly resembling the tale of oak bark. It makes no effervescence with acids; if thrown into water, it swells on the surface, till thoroughly wetted: and if brought into contact with burning coals, it takes fire and burns of itself, till reduced to yellowish ashes.

It is easy to discern from this account, that, though this is generally esteemed an earth, and known to the world by no other name, it is no pure native fossil, but contains more vegetable than mineral matter, and owes its origin to the remains of wood which has been long buried in the earth. It is dug in Germany and France; the quantities consumed in painting, in London, are brought from Cologne, where it is found very plentifully; but our own kingdom is not without it, it being found near Birmingham, and on Mendip hills in Somersetshire; but what has been yet found there is not so pure or fine, as that imported from Cologne. Hill's Hist. of Fossils. p. 64. and Dr Colla's Hist. of Fossils, p. 121.

COLOMBO, or Geography, a town of Italy, in the duchy of Tuscany; 6 miles E. of Leghorn.

COLOKITA, or Kolokitia, a town of European Turkey, in the southern coast of the Morea, in a gulf to which it gives name; 25 miles S.E. of Mistra. N. lat. 36° 47'. E. long. 22° 34'.

COLOMAY, a town of Poland, in the palatinate of Red Russia; 5 miles N.E. of Halecz.

COLOMA, in the Materia Medica. See COLUMBO.

COLOMBEL, Nicolas, in Biography, a French painter who was born in 1646, at Sottaville near Rouen, and became the scholar of Le Sueur, under whom he studied several years; he then went to Italy, where he affidulously copied the works of Raffaelle and Nicolo Pouffin; but though he enjoyed every advantage of education, and laboured to form his style upon the model of those great masters, the poverty of his genius ever appeared; and his pictures, though correctly drawn and carefully finished, generally wanted that elevation of thought and striking expression, which can alone give value to historic painting. However, in 1682, he sent four pictures which he had painted at Rome to Paris, and thereby gained sufficient reputation to cause his being chosen a member of the Academy upon his return to Paris in 1694. One of his most esteemed pictures is an "Orpheus playing on his Lyre," in the apartment of the menagerie in the royal palace. He died in the year 1717, D'Argenville.

COLOMBS, in Geography, a town of France, in the department of Paris, and chief place of a canton, in the district of St. Denis; 13 league N.W. of Paris.

COLOMERY, a town of France, in the department of the Meurthe, and chief place of a canton, in the district of Toul; 13 miles S.W. of Nancy. The place contains 8,783 and the canton 12,887 inhabitants; the territory includes 315 kilometres and 32 communes.

COLOMBIEN, De, in Biography. See VALENTINE.

COLOMBIER, in Geography, a town of France, in the department of the Upper Saone, and chief place of a canton, in the district of Voul; four miles N. of Vefoul.

COLOMBIER, Claude De La, in Biography, a celebrated French Jesuit, was born near Lyons, in which city he protected his studies, devoting most of his time to rhetoric and theology. Of the former branch of science he became a professor, and in the latter he was distinguished as a popular and instructive preacher. In this character he was noticed at the court of the duke of York, afterwards James II. of England, being made chaplain and confessor to the cheques, until he was banished under suspicion of being engaged in a conspiracy. He returned to his native country in the year 1684, where he died at the age of 41. Colomiere published six volumes of sermons, which are elegant, pious, and simple; they have been often reprinted. He published also a "Collection of Orations" in Latin, delivered by the author as professor of rhetoric; a volume of "Moral Reflections;" two volumes of "Spiritual Letters;" and "A System and Office for the Solemnity of the Worship of the Heart of Jesus," which the Jesuits employed a considerable time in every Catholic country, as a powerful instrument in favour of the papal cause. Patro, a well known writer, deferebres Colomiere as one who thoroughly understood the most refined of the French language. Nouv. de St. Hil.

COLOMBINI, Cosimo, an engraver of Florence, who engraved a great part of the portraits of painters inserted in the magnificent work of the "Museo Florentino." He flourished about 1574. Strutt. Heineken.

COLOMBONI, Don Angel Maria, a very celebrated painter of miniature and natural history, was born at Gubbio in the year 1608, and at a very early period of life became a monk of the order of Mount Olivet. He made considerable progress in literature, and in the mathematics, and published at Bologna, in the year 1669, a book on sundialling, entitled "Pratica Gnomonica, ovvero Tavole, colle quali si agevolmente può far da se gli Orologi da Sole." But he was not less admired for his miniatures, and for his excellent drawings of herbs, flowers, and birds, which he drew with such talfe and correctness, and finished with such extraordinary deftness and talents, that he was styled the Giovanni da Udine of his time, and the great Guercino used to call him the Raffaelle of his profession. He left two volumes of these drawings of birds, in which not only the beautiful colours and the delicacy of the plumage were admirably represented, but, what was more extraordinary, each appeared exactly in the attitude most usual to it or most characteristic. He spent great part of his life in Bologna, highly esteemed, and died in the place of his nativity in the year 1672. Baldinucci.

COLOMNRARO, in Geography, a town of Naples, in the province of Baflonata; 43 miles S.S.W. of Turpi.

COLOMIES, Paul, in Biography, was born at Rochelle; he embraced the Protestant religion, and followed his friend Isaac Vossius into England, where he attached himself to the cause of episcopacy, and even attacked the party among whom he had been educated, in a work entitled "Theologorum Presbyteriorum Icon," which raised him many enemies. He was, however, rewarded by being made librarian at Lambeth, and reader at the episcopal French church in London. Here he died in January 1702, leaving the reputation of great skill in bibliography. He was author of "Gallia Orientalis," in 4to. which was an account of Frenchmen eminent for oriental learning; of a familiar work respecting Italy and Spain, with many others of considerable note at the time in which he flourished. Bayle.

COLOMMA, Fabius. See COLUMN.

COLON, in Anatomy, from vexo, boldice; is a name applied to the greater part of the large intestine. See INTESTINE.
Col. in Grammar, a point, or character, formed thus (:) serving to mark a pause, and to divide the members of a period. See Pointing. See also Period, Comma, and Semicolon.

Grammarians generally assign the use of a colon to be to mark the middle of a period; or to conclude a sentence less perfect than the dot, or period: but a sentence less perfect than the period, is an expression extremely vague and indeterminate.

Others say, a colon is to be used when the sense is perfect, but the sentence not concluded: but neither is this sufficiently clear and express. Add to this, that in practice, our best writers confound the colon with the semicolon.

F. Builer attempts to fix the use of the colon: but he does not much distinguish it from the semicolon: he prefers the use of either, indiscriminately, and calls them by a common name, intermediate points: as being mediums between the comma, and full point, or period. Their use, according to this author, is to distinguish the supernumerary members of a period. By supernumerary members are meant such as the precedent ones do not raise any expectation of: i.e., such parts as have indeed a dependence on what goes before, even though what goes before has a complete sense, independent hereon: v. gr. "the Augustan age was so eminent for good poets, that they have served as models to all others: yet did it not yield any good tragic poets;" where the supernumerary member, and the use of the colon, are obvious. The most obvious and sensible use of the colon, he adds, is, when the supernumerary member is distinguished by some conjunction: as, notwithstanding, but, except that, unless, inasmuch as, yet, since, the rather as, provided that," &c. Some, indeed, use the colon in the middle of long periods, without any regard to supernumerary members: which custom was probably introduced to mark, that the breath is here to be taken almost as much as in a common period, in the place where the supernumerary period commences. But this, at best, is arbitrary; and the intermediate pointings may always be omitted in a period, if there be no supernumerary member, i.e., if there be no subsequent member, but what is expected from the precedent. As to the occasions where the colon is to be used, rather than the semicolon, there is nothing precise to be said of it; except that the colon shows the supernumerary member more detached, and sets it at a greater distance from the rest; and therefore marks a longer pause than the semicolon.

Accordingly, it seems preferable to use the semicolon before conjunctions adversative, restrictive, conditional, &c., as, "nevertheless, but, excepting that, however, otherwise, provided that." Again, where the supernumerary phrases not only supple the precedent, but depend on them for their regimen, and are, as it were, new parts thereof; there the semicolon seems preferable to the colon: v. gr. "You are regardless of the good works of God, who left thee to a God who is only jealous of your heart for your own happiness; a God who could be equally glorious in destroying you by his justice, as in saving you by his mercy." Or thus: "The discourse consisted of two parts; in the first was shown the necessity of fighting; in the second, the advantages that would redound from it." But this difference, it must be owned, has a dependence on something that influences all the points, and sways the whole doctrine of punctuation; viz., the length, or shortness, of the members and periods: for, when the phrases are long, we point higher than when short.

A latter author, in an ingenious discourse, "De Ratione Intermittendi," marks the office of the colon, and its difference from the semicolon, &c. more precisely; a colon, on his principles, serves to distinguish those conjunct members of a sentence, which are capable of being divided into other members, whereas one at least is conjunct. Thus, in the sentence, "as we cannot discern the shadow moving along the dial-plate, so the advances we make in knowledge are perceived by the distance gone over;" the two members being both simple, are separately by a comma: in this, "as we perceive the shadow to have moved, but did not perceive it moving;" the sentence being divided into two equal parts, and those conjunct ones, since they include others, we separate the former by a semicolon, and the latter by commas; but in this, "as we perceive the shadow to have moved along the dial, but did not perceive it moving; and it appears the grafs has grown, though nobody, ever saw it grow: to the advances we make in knowledge, as they consist of such minute steps, are only perceivable by the distance." The advancement in knowledge is compared to the motion of a shadow, and the growth of grasses, which comparison divides the sentence into two principal parts: but since what is laid of the movement of the shadow, and likewise of the growth of grasses, contains two simple members; they are to be separated by a semicolon; consequently a higher pointing is required to separate them from the other part of the sentence, which they are opposed to; and this is a colon.

Bishop Lowth observes, that a colon distinguishes a member of a sentence, whether simple or compounded, which of itself would make a complete sentence, and so requires a greater pause than a semicolon, yet, is followed by an additional part, making a more full and perfect sense. He adds, that a colon may be also used when a semicolon has preceded, and a greater pause is still necessary, though the sentence be incomplete; and that it is commonly used, when an example, or a freech, is introduced. Intro to Eng. Gram. ed. 1772. p. 207.


Gen. Ch. Cal. five-leaved; leaves linear, coloured on the inside, caducous. Cor. Petals five, with a nectaraceous fascia at the base. Stam. Filaments numerous, inserted into the top of a pentagonal column. Pith. Germ placed at the top of the column, in the centre of the filaments, tetragonal-globular; style longer than the filaments; stigma spher. Peric. Drupe globular, with four wings, opening into four parts. Seeds oval, two in each division of the drupe. Nearly allied to Grewin, and differing chiefly in the structure of the pericarp.


COLONIE, in Ancient Geography, a town of Asa Minor, in the Troade, placed by Strabo at the distance of 140 ferd from Ilium, in the territory of Lampsacus; it was a colony of Milifians.—Alsfo, a town of the name, placed by Strabo near Chrysa; by d'Anville, S. of Troas.—Alsfo, a town, mentioned by Anaximenes, cited by Strabo, and placed in Erythra.—Alsfo, a town of Greece, in Meechis; according to Ptolemy; now Grifco.—Alsfo, a town of Greece, in the Phocide.—Alsfo, the name of a rock, on the bank of the Thracian Bosphorus, over against the Cyanean island, at the entrance of the Euxine sea.—Alsfo, a town of Greece, in Thessaly.—Alsfo, a promontory near the river Lycaus.

COLONEL, the officer who has the chief command of a regiment of horse, foot, dragoons, or artillery. The lieu- tenant.
 Colonel of a regiment of horse, is the first officer in it, and commands it when present. His duty consists chiefly in keeping the regiment complete, in having it composed of men and horses that are fit for service; in taking care to have them well exercised and instructed in the different evolutions, so that they may be able, on all occasions, to form themselves quickly to the ground they occupy or act on, or to the manner in which they may with either to make or receive an attack. In France, Spain, and some other southern nations, colonels of horse have been usually called maistres de camp: But in Germany, and most northern nations, they are called ridefiers.

 Colonel of dragoons. His principal functions are the same as those of a colonel of horse. But he ought to be also in some measure acquainted with the duties of a colonel of infantry, as his men are liable to act either mounted or dismounted.

 Colonel of foot, or infantry. His functions are more extensive and diversified than those of a colonel of horse, as the infantry are employed for a greater variety of purposes, and on a greater variety of services. Colonels of infantry should be well acquainted with fortification, and with field-engineering (which, however, they seldom or ever are); since such a thorough and comprehensive knowledge of their principles, as enables an officer to apply them expeditiously and judiciously, is the belt and fasten guide to the proper formation and arrangement of troops in various situations, and to the advantageous occupation of ground and positions. A colonel of infantry should be particularly careful to maintain union and harmony among his officers, and contentment among his men, to acquire the esteem and confidence of both, and to make himself respected by them; to which nothing contributes more than a steady, uniform, and impartial enforcement of subordination and discipline. He should likewise be peculiarly attentive to the health and comfort of his men.

 Colonel of Artillery; the commander of a battalion of artillery. His duties, when properly understood and attended to, are various and laborious, both in war and peace, and require, in order to be well performed, not only abilities, but also application, knowledge, and experience. He ought to be an able mathematician and mechanic, and should be acquainted with all the duties of an engineer, that are connected with the use and application of artillery in different situations, and to different purposes; the construction of batteries, platforms, field-works, the occupying of positions with artillery, to the best advantage, both as to direct and flanking fires, &c. Whatever situation he may be placed in, or whatever service he is engaged in, he should understand thoroughly what nature and species of ordnance is best adapted to it. He should be acquainted with all the most useful experiments that have been made with artillery in the different nations of Europe; he should know the greatest distance at which balls can be bitter in breech effectually; the different charges of powder, best adapted for different services, and different distances. And he should not only be well acquainted with the wide differences between the ranges of cannon-flies and shells in the air, and those which the parabolic theory gives for them in vacuo, but also be able to approximate, nearly to the truth, the distances to which projectiles will go in the air, thrown with given charges of powder, and given degrees of elevation. In short, he ought to know a variety of things, which few officers of artillery actually do know.

 Colonel of Engineers. See the article Engineers.

 Colonel, lieutenant, is, as has been already observed, the second officer belonging to a regiment, and commands it in the absence of the colonel.

 Colonel General of the French Infantry, or Colonel General d'Infanterie, is an appointment of great trust and authority, which took its birth, or originated, under Francis I. in 1544. It became an immediate gift of the crown, under Henry III. in 1584. It was at first suppressed, because it gave too many prerogatives, and too much power to the person who was invested with it. Under Louis XV. however, it was re-established in 1741, in favour of Louis, the first duke of Chartres. This officer had originally the right of nomination to every commission and place of trust in the infantry. He could order courts martial, and enforce the sentences awarded by them, without any suspension of his power in that respect, by an appeal to a superior tribunal; and he had a company in every regiment of infantry, which was called the colonel general's company.

 Colonel General d' Infanterie de Suisses et Grison. This appointment was not held of the crown; but it was a post always given to a prince. It took its rise in right of office under Charles IX. in favour of the son of the counts of Montmorency, killed at the battle of St. Denis. All the Swiss and Grison troops were subordinate to the colonel general, the captain des cant Sus et de la garde excep'd. He appointed colonels and captains. The succesors of him were chosen by the king, and the officers of the nation, to be included in the promotion of general officers, and enjoyed several other prerogatives.

 Colonel General de la Cavalerie légere et étrangère. This charge, or employment, was created in right of office under Charles IX. It was, however, known before his time, in 1449, under the title of capitaine général de la cavalerie Albaoise." Under Louis XIII. there were two such colonels general, one of the French cavalry, and the other of the German cavalry. Though those general officers enjoyed great honours and prerogatives, the generals of the Roman cavalry, under the emperors, were persons of still greater importance. For they had the same authority over the troops and militia, that the kings and dictators had. The emperors treated them in their regulations and constitutions, as though they were the highest rank, eminence, magnificence, and celebrity. They enjoyed an authority almost absolute, over all military people.

 Colonel General des Dragons, colonel general of dragons. This appointment was created in 1689, by Louis XIV. It was, like the preceding ones, favoured with an attribution of great honours and particular prerogatives.

 Colonel de Troupes Légères, colonel of light troops. This officer ought to be well instructed both by study and experience, in the art of petty warfare, and the management of detachments. For, as he is almost always responsible for the corps confided to his charge, and forced to take advanced positions in an enemy's country, he is of course exposed to be surprised, taken, or at least beaten.

 Colonelle, Compagnie, the first company in a French regiment.

 Colonel, Adam, called the Old, in Biography, a painter who was born at Rotterdam, in 1633, but att reigned and died in London, in 1685. The subjects of his pictures were generally wakes, country fairs, rural subjets, and cattle; besides which, he made several copies from the pictures of the Baffains, with success. He had a son called Adrian Colonli the young, who received instructions from
from his brother-in-law, Van Diek, in addition to the lessons bestowed on him by his father. He frequently painted the figures in the landscapes of Van Dyck, as well as in those of other masters; and sometimes imitated the touch of Saverio Rosa. At other times he produced pictures of history, but more generally those of cattle, conversations, or landscapes. Adrian died in the year 1761, aged 33. Elstington.

Coloni, Cape, in Geography, lies on the W. coast of Atlantic Turkey, N. of the Gulf of Smyrna. N. lat. 39°. E. long. 26° 36'.

Colonia, in Ancient Geography, an episcopal town of Asia, under the metropolis of Scutis; situated in the first Armenia, and called also Tavara.—Allo, an episcopal town of Asia, in Cappadocia.—Allo, a town of Italy, in Etruria.—Allo, a town of the Ile of Albion, in the route from Londinium to Lugwalliam ad Vallum, between Caesaromagus and Villa Paulfini, according to the Itinerary of Antonine. Although our antiquarians are divided about the situation of Colonia, it seems, upon the whole, to be most probable that it was at Calceph-er, on the river Colne, from whence it derived its name.—Allo, a town of the Danuvi, according to Ptolemy, which some, as Camden and Baxter suppose, to have been Coldingham in the Mars, but which was more probably situated at or near Lanark, in Clydedale. See Coldingham.

Colonia, in Geography, a town of Istria; five miles S.S.E. of Rovigo.

Colonia Agrippina Ubiorm, in Ancient Geography, a town seated on the banks of the Rhine; now Cologne. It was built by the Ubii, when they left Germany to establish themselves in Gaul. Agrippina, the mother of Nero, fixed a colony of veterans in this place, and gave it her name in honour of the place of her birth.

Colonia Equeftris, a town of Gallia Belgica, assigned by Piny to the Helvetians; but by Ptolemy to the Sequani. The Itinerary of Antonine marks it under the name of "Equesftris," between Bantus and Lucus Laufatianus. It was also called "Nonundunus," or "Nundunum," but when it became colony, the Romans called it "Colonia Equesftris." It is now Nion.

Colonia Marcia, the town called Cesaris de Pulaeine. Colonia Julia, a town and Roman colony of Germany; now Bonn. Colonia Julia Colfa, a town of Spain, which was a Roman colony; now a village called Xelfa. Colonia Julia Hippetia, a town and Roman colony of Italy; now Umbria; now Spello. Colonia Marcia, a town of Spain, which had the title of Roman colony; now Marchena. Colonia Senecis, a town of Italy, in Etruria, which was a Roman colony; now Scena. Colonia Sepulmonarum Juniorum, a town of Gaul, with the title of colony; now Baziers. Colonia Trigana, now Kohn, or Köln, was situated at a small distance from the Rhine, and about a mile from Cleves. Colonia Ulpi, is now Cleves, which see.

COLONIS, an island of Greece in the Argolic gulf, according to Pryn.

COLONNA, Giov. Paolo, Maestro di Capella di San Pietro di Bologna, in Biography, was the son of Antonio Colonna, alias del Corno, a celebrated organ builder of Brescia. He composed but few operas; indeed, we know of but one, Amleto in Cipro, for the theatre of Bologna, 1602; but he published about the latter end of the 17th century many excellent works for the church, of which P. Martin has given a list, to the amount of twelve, in the second volume of his History of Music.

It was the opinion of the late Dr. Boyce, that Colonna was Handel's model for choruses accompanied with many instrumental parts, different from the vocal. But it must, however, be owned, that Handel has greatly surpassed his model in energy, fire, and vigour of genius. The psalms of Colonna in eightves vocal parts, published at Bologna in 1694, have been very justly admired for their masterly composition. Paolucci has inserted the hymn, "Pange lingua," set in plain counterpoint of four parts, by him, in a manner sufficiently simple and syllabic for the most zealous reformers of church music. His "Sacri lamentationi della fettimana santa, a voce sola," published 1689, contain many pleasing and elegant fragments of pathetic recitative, which we should have admired much more if we had not previously been acquainted with the works of Carissimi, who had anticipated not only all the thoughts of Colonna in this species of music, but almost all those of every composer of the present century. The airs of these lamentations are too short to make much impression on the hearer.

Colonna had a controversy with Corelli in 1685, concerning the consecration of fifths in the fifth movements of the third sonata of his Opera 2da. Every lover of music will be sorry that the charge against Corelli should be well founded; but it must be owned that the base is indefensible in the passage which has been condemned by Colonna, and was not likely to have passed unconfuted, even in an age much more licentious than that of Corelli.

Antimo Liberati, with whom Colonna was in correspondence at the time of this controversy, seems to defend Corelli's violation of the known rule against the consecration of fifths, in a letter written 1635: "Sopra un leggio di quinti," in which he reasons thus: "If a quaver reef, or even a semiquaver, were not sufficient to satisfy the rule against fifths and eighths, a composer writing in many parts would have very narrow limits for the expansion of his genius and fancy, or for varying the harmony." But with due respect for the authority of Antimo Liberati, and with peace to the affections of the gentle Corelli, the passage is unwarrantable, and seems the more inexplicable, as several better basses were easy to find, without altering his design, or destroying the effect of his trebles. It appears that the excellent theorist Berardi had a reverence for the professional erudition of Colonna, by his dedicating to him the seventh chapter of his "Miscellanea Musicale."

COLONNA, Michele Angelo. See Angelo.

Colonna, Marc-Antonio, born from an early age in the service of the Spaniards, and rose to great military reputation. He was appointed by pope Pius V. general of his galleys, and served in the famous battle of Lepanto, gained against the Turks in 1571. On his return he was awarded a triumphal entry after the manner of the ancient Roman conquerors. He possessed several high civil offices, as confidant of Naples, and viceroy of Sicily, and died in Spain in 1584. Moren.
He accompanied his father into Spain, and studied at the universities of Alcalá and Salamanca. Philip II. gave him an annuity, and he was made chamber by Señor V. At the death of the king his patron, he delivered a funeral oration, which he printed. He was henceforth a promoter of literature, and collected a magnificent library. Owing to his great skill in canonical law, and the support which he gave to the claims of the Catholic king, he was made vicar, of Catálica. He afterwards wrote a canonical defence of the pope's conduct in his dispute with the republic of Venice. This and four other letters and harangues he published, and died in Rome in 1568. Moreri.

Colonna, Fabius. See Colonna.

Colonna, Francesco, was born about the middle of the fifteenth century, probably at Venice, and entered young into the order of Dominicans. The work by which he is chiefly known is "Hypnerotomachie di Poliphilo," which signifies the combat of Love in a dream, and the Lover of Poliphilo. It consists of table, history, allegory, architecture, mathematics, &c. and is written in a language compounded of words taken from six or seven different languages. It was printed by Aldus in 1499, and a French translation was published in 1545, and has been several times reprinted. The original and translation have been in great request among collectors of books, as well on account of their rarity, as for the sake of the beauty of the numerous wooden cuts with which the work is decorated. Colonna died at an advanced age, at Venice, in the year 1527.

Colonna, Prospero, a distinguished military commander, was younger son of Anthony prince of Salerno, and born about the year 1452. He engaged in the service of Ferdinand, king of Naples, and after his death, in that of Charles VIII. king of France. When that prince overtook the confederacy of Naples, Colonna, with his cousin Fabrizio, rendered him some signal services, but upon a charge of perfidy, they returned to their former allegiance. Prospero assisted in the recovery of the kingdom of Naples; he was at the battles of Barletta and Garigliano, at which the French were worsted; and he signified his valor and conduct at a variety of sieges and other military actions. In the year 1557, while attempting to defend the province of Amalfi against the French, he was made prisoner, and carried to France, but being liberated, he returned his profession in order to revenge the disgrace that attached to him while a captive. He died in 1575, aged seventy-one, leaving behind him a very high character as a general; he was rather prudent and cautious than formed for remarkable enterprises. Though slow and meditative, he was, by constant vigilance, generally feared from his pride. He was the friend and patron of learned men. Moreri. Robertson's Hist. ch. v. vol. ii.

Colonna, Pompeo, was brought up by his uncle Prospero, and educated by him for literary pursuits. The young man devoted to the profession of arms, and distinguished himself as a military man till he was compelled to assume the ecclesiastical character. He was made bishop of Rieti, and obtained many lucrative benefices. He was, however, little attentive to the duties of his sacred office, and so regarded himself as the deacon that ought to be attached to it, that he accepted a challenge, and tore his cassock to pieces that he might not be prevented from fighting. On a late report of the death of pope Julius II. in 1552, Pompeo joined in raising the cry of liberty, and took possession of the capitol. For this he was deprived of his benefices, but by the interest of his uncle, matters were again accommodated, and in 1557, he was elevated to the rank of cardinal. Still, however, inclined to turbulent measures, his conduct gave his enemies the opportunity of charging him with the intention of putting the pope to death, in order that he might succeed to that high dignity: he was accordingly deprived of his offices, in which he was reinstated on account of some important services which he rendered to the signing pontiff. He was afterwards viceroy of Naples, where he died in 1553. He was esteemed a patron of literature, and wrote a poem "D. Landibus murorum," chiefly in praise of Vittoria Colonna. Moreni. Robertson's Hist. ch. v. vol. ii.

Colonna, Vittoria, a learned lady and poetess, was born at Marano in 1490. At the age of seventeen, she married Ferdinand Francis D'Avalos, marquis Pescara, who, by her influence, was dissuaded from accepting the kingdom of Naples, which was offered him after the victory of Pavia, in order to detach him from the service of the emperor Charles V. After his death, which happened in 1525, she lived in retirement, devoting herself to poetry; she kept up, with much credit to herself, a friendly and learned correspondence with some of the most celebrated literary characters of the age. In 1521, she retired to the monastery at Orvieto, and from thence she went to St. Catherine in Viterbo, but in 1547, she returned to Rome, where she died. Her poems have passed through many editions, and have been printed with the commentaries of learned men. Moreri.

Colonna, in Geography, a town of European Turkey in Dalmatia; 24 miles N. of Spalatro. — Allo, a town of Italy, in the Campagna di Roma; 12 miles from Rome. — Allo, a cape of Naples, on the E. coast of Calabria Ultra. N. lat. 35° 6'. E. long. 17° 56'.

Colonna, in Geography, a town of France, in the department of the Jura, and chief place of a canton in the district of Delphagne. In 1525, it was captured by the French and of Delphagne. In 1525, it was captured by the French and

Colonne, a cape on the coast of the Morea, in the Mediterranean. N. lat. 35° 32'. E. long. 24° 17'.

Colonnossis, in Ancient Geography, a place of Asia, in Lycaonia.

Colonsay, in Geography, one of the islands of Scotland, called the Hebrides. It belongs to Argyllshire, and as it is separated from Oranfay, merely by a narrow channel, which is dry at low water, Colonfay and Oranfay may be considered but one island. Although the inhabitants of the former cannot correctly be termed mountais: they are high, rugged, and covered with heath. The arable land, which consists of about 3000 acres, produces early and tolerable crops, as the soil is light and mixed with sand along the shores; part of this land has lately been converted into pasture, and numbers of black cattle are fed on the two sites. A monastery of Cillertian monks formerly flourished in Colonfay, and the remains of the walls of the abbey gave place some years past to a farm house; a priory attached, stood in Oranfay, where the ruins still remain, and are considered superior to any other religious building in the Hebrides, with the single exception of Icolmilk: there are bucolic fragments of several chapels in Colonfay. The inhabitants make large quantities of kelp from the seaweed found on the coast; and the banks which surround the islands produce plenty of fine coral. The population is estimated at about 720, and the duke of Argyle is the principal proprietor.

Colonsay, Little, an island, and one of the Hebrides, situated between Gometra and Staffa. There are several specimens of basaltic pillars in the Laffer Colorfay, but it has no other inhabitants than one family who attend a few sheep.

Colonum, a place of Greece, in Attica. Here was a forest
a foret, consecrated to the Eumenides. Sophocles, according to Stridas, was born in this place.

**COLONUS**, an husbandman, or villager, who was bound to pay yearly a certain tribute, or at certain times of the year, to plow some part of the lord's land; and from hence comes the word *dewen*, which is called by the Dutch *boer*.

**COLONY**, *Colonia*, is properly a number of persons of all sexes and conditions, transported into a remote province, with a view of remaining there, and for the purpose of cultivating and inhabiting it; but among commercial nations, the term is used in a larger and less proper sense, and applied to the temporary residence of merchants and agents in another country. The word colony originally signified no more than a farm, i. e. the habitation of a peasant, *colonus*, with the quantity of land sufficient for the support of his family; "quantum colonus unus arear poterat." It is derived from the Latin word *colere*, I till or cultivate; hence *colonia*, a husbandman, and *colonia*, a body of farmers, sent to cultivate the ground in a distant country, and, by extension, the place itself. From the Latin the word has passed, with scarcely any alteration, into the modern languages of the west of Europe.

We may distinguish, generally, four kinds of colonies; viz.
1. Those that gave rise to cities or settlements; inhabited a country, where the people are become too numerous, so that they cannot any longer conveniently subsist together. Such colonies were established by victorious princes and people, in the middle of unpeopled nations, to keep them in awe and obedience.
2. Those that are formed by emigrants, driven from their native country by oppression and persecution to seek a foreign settlement, and to subsist by agriculture, and afterwards by commerce. Such colonies were called "colonies of commerce," because trade is the sole object and occasion of them.
3. The first class we may refer the colonization which took place in the earlier ages of the world, and which served to disseminate the human race, first through the various regions of the earth, and afterwards through other more remote parts of the globe. At this early period colonization was of course more frequent than it is at present. The increase of a tribe beyond the limits of a comfortable subsistence upon the lands which were occupied, would be a sufficient motive for inducing the younger members of the society to remove from the prospect or actual pressure of want, to some unoccupied territory. Some antiquaries, however, are of opinion that soon after the deluge, when the descendants of Noah became numerous, a division of the ancient continent and its adjacent islands was made, probably by lot, among the heads of the several families. This opinion seems to be in some measure supported by the authority of Moles, who says, (Gen. x.) on mentioning the children of Eber, that the name of one of them was "Peleg" (division), for in his days was the earth divided. (See Dispersion.) However this be, the gradual extension of the habitations of mankind must have corresponded with their increase; and it seems to have been unrestrained by claims made upon the uncultivated spots. But this unlimited right of disposition has long since ceased in most parts of the world; and hence it has become necessary for colonists, who seek new scenes for their labours, either to unite with the natives as friends, or to subdue them by conquest, if the colony is founded upon hostile principles. At a subliterate period, the different states of ancient Greece, such were Athens, Sparta, Corinth, and Argos, polled territories of very limited extent; and the increase of population gave rise to various emigrations from all those states. The colonies of the Dorians settled chiefly to Italy and Sicily, which, in the times preceding the foundation of Rome, were inhabited by barbarous and uncivilized nations; those of the Ionians and Eolians, the two other great tribes of the Greeks, to Asia Minor and the islands of the Aegean sea, the inhabitants of which seem at that time to have been pretty much in the same state as those of Sicily and Italy. The emigrations now mentioned, and some others of a similar nature, were undertaken by private individuals, with no authority from the government; and as they were generally directed towards distant and transmarine settlements, they remained but a flight connection with their original countries. The parent state, indeed, considered the colony as a child, at all times entitled to great favour and indulgence, and owing in return much gratitude and respect; but, moreover, considered it as an emancipated child over whom no direct authority or jurisdiction was claimed. The colony settled its own form of government, enacted its own laws, elected its own magistrates, and made peace or war with its neighbours as an independent state, which had no occasion to wait for the approbation or consent of the parent city. The colonists, indeed, remembered the land of their fathers with filial affection and respect; they honoured its gods, by offerings of first-fruit to their temples; they retained a predilection for its customs and laws, as well as its religion and language; they yielded to its citizens the place of distinction at public games, and to its priests the holy honour of first inspecting the entrails of sacrifices. In war they generally followed the fortunes of the metropolis, as allies upon equal terms; but as they were perfectly independent, received no protection from her, and often equalled her in resources, they always refused to come forward as auxiliaries, when unfair terms were proposed. Thus, the Sicilian colonies refused to admit an Athenian army into their territories, for the purpose of retaking, on an expedition; and, in the Persian war, the republic of Syracuse, when intreated by the Lacedaemonians to aid the common cause, refused to lend any assistance, unless their chief magistrate, Groton, were allowed to command the united forces. Sometimes the parent country, conscious of her superiority and strength, attempted to exact from the colonies, as matter of right, the usual marks of filial attachment. Thus, Corinth was defied by her colony at Corcyra, for her inferiority of wealth and trade; and the endeavour to obtain by force, the usual tokens of remembrance. The colonists appealed to Athens, which took their part, and retained them as useful allies, especially during the Peloponnesian war. Pothidae, another Corinthian settlement, took the part of Athens, until her impolitic tyranny urged it to throw off the yoke, and appeal to Sparta and Corinth. After a long and severe struggle, the Athenians were successful; sent new colonies to occupy the confederated and vacant lands; continued their oppressive government; and retained their dominion over Pothidae, until the invasion of Philip. When the progres of Cyrus exposed the Atlantic colonies of Greece to extreme danger, they in vain applied to Sparta for assistance; and, being soon conquered by the Persian monarch, they remained in subjection, until the victories of Ptolemy and Myrace restored them to freedom; but despairing of long maintaining their independence, they formed a compact alliance with Athens, who availed herself of the opportunity of a general alarm, to propice an universal contribution from all her colonies and allies, for the great purpose of reifying the Persian power. We might cite many other instances to exemplify the independence of the Grecian colonies on the states from which they originated. Nevertheless, the benefits in point of civilization resulting to barbarous countries from colonies of private adventurers, migrat-
grating from countries more advanced in the knowledge of these arts which mitigate the condition of human life, have entailed honour on those who imparted them, and claimed returns of respect and gratitude from those on whom they were bestowed. From this mode of colonization, reciprocal advantages have been derived. The natives already in possession of the country, to which colonies have migrated, are benefited by the introduction of new arts; while, at the same time, the adventurers receive the reward of their knowledge, valour, and conduct, by the superior degree of influence which they acquire beyond what they would have possessed if they had remained in their own country. Thus individual adventurers, who have fitted out expeditions at their own charge, and conducted colonies to a permanent settlement by their own skill and valour, have, in some memorable instances, attained even to supreme authority. This seems to have been the case with regard to the colonies anciently established by ΑΑαίδαεδας in Sicily, by Inachus in Argos, by Cerecos in Attica, by Janus in Italy, and by Cadmus at Thebes in Greece. From the devastation in which the memory of these adventurers, who were mostly of Egyptian origin, were held, it is evident that they had imparted into the countries where they settled great and important improvements. The great literary renown which Athens acquired in progress of time has rendered us better acquainted with its early history; so that we can form some idea of its primitive laws. The regulation of the connexion between the cities is recorded as being due to Cerecos; from whence some etymologists, as Euclitomithi, deduce the origin of the appellation ΑΑαίδαεδας, by which he was distinguished. The collection of the inhabitants into towns and villages, is said to have been an improvement of his immediate successors, who, it is probable, also introduced the regulation of local jurisdictions, and the division of the land in property among the then existing heads of families, to be inherited by their descendants. This seems to be, in fact, the main foundation of perfect civilization, by introducing this inequality of condition, as some of the families increased or prospered more than others, which, notwithstanding the reverses of some speculative politicians, is absolutely necessary to civilized life. This mode of colonization is seldom attempted in more modern times, because the maritime nations of Europe have laid claim to all heathen lands which their subjects discovered, and have prevented even their own subjects from endeavouring to ameliorate the condition of these countries, by attempting the formation of independent Christian states. The Jesuits had, indeed, formed a considerable establishment for the improvement of the natives in South America; but it gave umbrage to the Portuguese government, and the neglect of military affairs rendered the overthrow an easy undertaking. The Moravian brethren have similar settlements in the most northern parts of America and Europe, where the inhospitableness of the climate is such, that the country is not worth contending for. The establishment of the Macedonian dynasties in Asia and Africa; and, in later times, that of the northern tribes in the southern parts of Europe and of Asia, are signal examples of this mode of colonization. It is notorious, that it was for the establishment of colonies, referred to the first class above-mentioned, that, during the declension of the Roman republic, those torrents of barbarous nations, infusing, for the generality, of the north, overran the Gauls, Italy, and the other southern parts of Europe; and, after several bloody battles, divided it with the ancient inhabitants, and blended their own habits and manners with those of the nations which they subdued, or in which they obtained either temporary or permanent settlements.

To the second class of colonies belong those of a military nature, which served as guards or garrisons, for the maintenance of a conquered country. The Romans reverted to this mode of colonization more frequently than any other nation; and added, to the original motive, that of providing retreats for the aged and worn-out soldiers; as also for the settlement of the poorer classes of Roman citizens. Nor were the interests of the rich forgotten, in the establishment of Roman colonies. The spirit of the Roman laws having refrained the mercantile classes to their proper rank in society, the capital accumulated by their commanders during the long continued and widely extended succour of the Roman republic, was of course invested in land. The extent of Italy was too small for the capital, thrown, by this means, into agriculture; and the capitals were therefore obliged to seek new lands, on which it might be employed. It appears that the eastern shores of the Mediterranean sea were, at the time of their falling under the Roman dominion, in the highest possible state of cultivation. The provinces settled on these shores, were, therefore, the scenes of oppression rather than of improvement, and the plunders, accumulated there, transferred to Gaul, and other western provinces, to be employed in the purchase and improvement of land, or in the support of those who resided there. The high rate of interest allowed by the Roman laws, made it also far better to employ money in loans than in commercial speculations, which cannot be supped, in the restricted and degraded state of Roman commerce, to have yielded the same profit as the former. Senea, the philosopher, is said to have had, at the time of his death, no less than 600,000 &. flowing due to him from the colonists in Britton; the sudden calls in of which produced a rebellion. Besides, Rome, like most of the other ancient republics, was originally founded upon an Agrarian law, which divided the public territory in a certain proportion, among the different citizens who composed the state. The course of human affairs, by marriage, by succession, and by alienation, necessarily deranged this original division, and frequently threw the lands, which had been allotted for the maintenance of many different families, into the possession of a single person. To remedy this disorder, a law was made restricting the quantity of land which any citizen could possess to 500 jugera, or about 352 English acres. This law, however, was neglected or evaded, and the inequality of fortunes went on continually increasing. The greater part of the citizens had no land, and without it the manners and customs of those times rendered it difficult for a freeman to maintain his independency. The people, therefore, became clamorous to get land, and the rich and great, we may readily imagine, were determined not to give them any part of theirs. To satisfy the unquiet and clamorous people, it was frequently proposed to found out a new colony. Accordingly, Rome assigned them lands, generally in the conquered provinces of Italy, where, being within the dominions of the republic, they could never form any independent state; but were, at least, merely a fort of garrison, which, though it had the power of enacting by-laws for its own government, was at all times subject to the correction, jurisdiction, and legislative authority of the mother city. The founding out of a colony of this kind, not only gave some satisfaction to the people, but often established a fort of garrison, too, in a newly conquered province, of which the obedience might otherwise have been doubtful and precarious. Some of these colonies were of a civil, and others of a military nature. In their manners and internal policy, the colonies formed a perfect representation of their great parent; and they were soon endeared to the natives by the ties of friendship and alliance; they effectually diffused a reverence for the Roman name, and a deference, which was felicitous and dom.
COLONY.

don disappointed, of sharing, in due time, its honours and advantages. A Roman colony, whether we consider the nature of the establishment itself, or the motives for making it, was altogether different from a Greek one. The words, accordingly, which, in the original languages, denote those different establishments, have very different meanings. The Latin word, colonia, signifies simply a plantation. The Greek word αυτοικία, on the contrary, signifies a separation of dwelling, a departure from home, or a going out of the house. In conformity to this distinction of names, we may observe, that the colonial settlements of the Greeks were planted in distant countries, and amongst barbarous tribes. They were either planted on the coasts of Greece, or in the states immediately in the neighbourhood, which had already been well peopled, but in Gaul, Sicily, and the south of Italy; in Greece and Egypt; in Illyria and Asia Minor. The Roman colonies, on the other hand, were at first planted in the immediate vicinity of Rome. During the second Punic war, the city was surrounded by no fewer than 50 establishments of this kind; which served as so many garrisons or advanced posts for her defence. Ancient authors mention no less than 164 colonies settled in Italy, from the foundation of Rome to the death of Augustus; whereas those planted in all the provinces were only 199. From this consideration it appears, that the Italian colonies were materially different in their constitution and uses from the colonies of the provinces. The emigrations from Rome to the conquered towns and lands of Italy, and afterwards of the foreign provinces, were the operations of war and plunder. Whenever an Agrarian division of conquered territory was proclaimed, the discontented citizens presented themselves in a body; and if a sufficient number did not offer to form a legion for retaining the conquest, which they called a colony, the deficiency was supplied from all the tribes by lot. As this system of conquering policy was efficacious at first, until the whole of Italy had been subdued no emigration ever took place to any transmarine, or transalpine countries. Among the Romans there were two kinds of colonies: those sent by the Senate, and those that were military, confounding of old soldiers, broken and disabled by the fatigues of war, who were thus provided with lands, as the reward of their services. The colonies sent by the Senate were either Roman or Latin, i.e. they were composed of Roman or Latin citizens. The colonies of Roman citizens had the right of suffrages, and could reclaim the rights of citizens whenever they chose to remove to the capital. The Latin colonies lost their rights for ever, nor had they any right of suffrages without an express permission. According to Ulpius (lib. i. D. de Cens.), there were other colonies, which had little more than the name; only enjoying what they called jus Italicum, i.e. they were free from the tribute and taxes paid by the provinces; such were the colonies of Tyre, Berytus, Helipolis, Palmyra, &c. Between all the Roman colonies and the metropolises, there subsisted the closest connexion. The form of colonial government was modelled upon that of Rome. The laws, if not changed at once, were gradually moulded by the spirit of the Roman jurisprudence; the officers were almost all sent from the capital; the mandates of the republic were more promptly obeyed in the provinces than in the city itself;—in a word, the establishments which have been called colonies, and, compared to those of modern times, or of the Greeks, were military stations; garrisons, placed in conquered countries; advanced posts of a great army, of which the commander in chief held his head quarters in Rome, and occasionally made a progress through the different cantonments. From these settlements taxes were levied, according to a census; and, after paying the expenses of their own government, they transmitted a revenue to the Roman treasury. Men were raised for the Roman army according to a muster-roll. When the grandeur of the Roman name extended across the ocean and the Alps, the rights of citizenship became valuable, as the title to power, honours, and plunder. The allies, or colonial and provincial settlements of Italy, then demanded the communication of this privilege; and the refusal produced that "Social war," which may be justly deemed the end of the regular republican constitution. In consequence of the Julian law, which terminated this war, of other laws afterwards passed at the states of Italy, whether allies, colonies, or pretorians, obtained the full rights of Roman citizens. Until the year A.D. 65, no colony but one, which never flourished, had been planted beyond the confines of Italy. The military colonies, introduced by Sulla, and much favoured by Augustus, were remarkable only for a form of government more entirely military than that of the other settlements. All were equally subordinate to the central government, and equally obedient to its decrees.

The first foreign colony which the Romans planted was in Carthage, A.U.C. 710, when Julius Cæsar formed the plan of refounding that defeated city by means of a colonial establishment. The first colony planted in Italy was that of Cæsarea, A.U.C. 4. The practice of sending Roman colonies to the provinces, where they did not enjoy all the privileges of the Italian colonists, was very common after the experiment of Julius Cæsar. He himself transplanted 80,000 citizens in this manner. (Sueton. in Jul. Cæs. c. 42.) After the time of Augustus, who planted 28 colonies in Italy (Suet. in Octav. c. 45.), the custom of planting Italian colonies seems to have been abandoned. His successors did not plant as many as 20; and preferred forming those settlements beyond seas. Livy does not even mention a transmarine or transalpine colony, although he constantly relates the foundation of those in Italy. Dacia and Britain, the most difficult and insecure of the Roman conquests, had only, the former four, and the latter five, Roman colonies. Twenty-five colonies were settled in Spain; and Africa, the most peaceable of all the Roman possessions long before the downfall of the commonwealth, received, after the usurpation of Julius Cæsar, no less than 57 colonies, exclusive of Egypt. From these circumstances we may be led to conclude, that the Italian establishments were founded with different views, and in a different age of the Roman history, from the settlements in the provinces. M. Vaillart has filled a volume in folio with medals struck by the several colonies, in honour of the emperors who founded them. The ordinary symbol they engraved on their medals was either an eagle, as when the western limits were distributed in the colonies; or a labarum holding a plough drawn by a pair of oxen, as when the colony consisted of ordinary inhabitants. On all the medals are seen the names of the Decemvirs, who held the supreme rank, and had the same authority there as the consuls had at Rome.

In the political relations of the Roman settlements with their parent city, there is some resemblance to the political relations of modern colonies with their mother countries. But in the policy of a state so neglectful of every thing except war, we cannot expect to find any parallel to those commercial views, by which the plantation of modern colonies has been undertaken, and their connexion with the European governments maintained. The objects of the Romans, in planting their colonies, were conquest and plunder; so that detachments of emigrants incorporated with, and governed, the old possessors of the soil. In modern
modern times the chief objects have been trade and agriculture; the most important settlements have been made in defunct countries, or districts, where ancient inhabitants were extirpated by the first settlers. In this respect, then, the Roman colonies rather bear a resemblance to the Asiatic establishments of modern Europe; but they differ from these, too, in the structure of their government. The constitution of the Italian colonies was formed upon the Roman model, and varied with its changes. The provincial governments of Hindooslan, and the islands of the Indian ocean, very little resemble those of their European masters, and are rather allied to the spirit of the oriental legislation. The provincial governments of the Roman transmarine territories here, in every respect, the same kind of relation to the metropolis, which the East Indian establishments do to the states of Europe. The inhabitants retained, in a great degree, their own laws; they were ruled and oppreseed by a Roman magistrate, and an army, composed partly of Roman, partly of native troops; their country was the scene of every criminal excess in politics and manners, and the source of large supplies to the plunderers of the world.

The species of colonies now described is not restricted to the Romans, but it has been adopted by almost every nation, both ancient and modern, with very little variation. To it we may refer the establishment of the Normans in England, and of the English in Ireland. In a still later period, the Portuguese and Dutch have established themselves in India; but the English East India company have, on the contrary, repressed, as far as possible, the colonization of the countries they possess there, as these directors observe that "the energy of the European character becomes obliterated in the course of a few generations."

The commerce of Carthage, together with her extensive continental possessions, enabled her to provide for her increasing population at home. The want of an outlet for inhabitants formed no part of the motives that induced the Carthaginians to settle foreign colonies. Their colonial establishments, indeed, were mostly founded in the same manner with the transmarine and transalpine provinces of the Romans—conquered countries, retained in subjection, from ambition and pride, by means of a Carthaginian governor, and a few followers, prompted by idleness, or the love of change, or the desire of distinction to follow in his retinue. However, the relations of the new establishments with the mother country were different; in several respects, from the relations which connected the distant parts of the Roman dominions with the metropolis. The Carthaginian colonies were, in reality, trading correspondents to the mother country; and should have found a place under the 4th class of colonies rather than here, if they had not been immediately connected with the Roman. It is probable that the Carthaginians received the surplus of the rude produce of Sicily, Sardinia, and Spain, which Africa did not yield, and exported thither those manufactures, which would naturally be raised in a country fully peopled, and long habituated to traffic. From the superiority of their navigation too, the skill of the Carthaginian merchants, their connexions long established with the Levant, more particularly with the great emporiums of the East, Tyre and Smyrna, and from the greater trading capitals of those rich nations; they would more likely furnish the colonies or provinces with Asiatic commodities, of which Carthage would be the natural entrepot for the countries to the west of the Mediterranean. History has preferred two topics of commerce and navigation between the Carthaginians and Romans, conceived in the true spirit of the modern colonial policy; for which see Polyb. i. iii. c. 22.; or Brougham's Colonial Policy, &c., vol. i. p. 21, &c.

In this connection we might mention another species of external colonies, produced by the disproportion of weaker states by those who are stronger, in order to extend their borders, or to profess some advantageous situations for trade, or for war. The bigotry of the Europeans, at the time of the discovery of the West Indies, led them to look upon the natives of those countries in a very unfavorable and contemptuous light, on account of their being heathens and idolaters, and made them hearken to the measures which the constitution of their own country, so that they could not but obtain the object of their wishes. The great disproportion also in the numbers of the invaders and of the natives, in some measure, impelled the Europeans to adopt the most feasible methods, to perpetuate the terror which the natives had originally manifested at the effects of their firearms. The consequence of those feelings was, that the natives of most of the islands were soon exterminated, except in some very small ones which the Europeans left unnoticed. On the continent, however, the natives fled, as they have there sufficient space to retire from the neighbourhood of their visitors.

To the third class belong those colonies that have been formed by refugees from countries, in which they were oppressed or persecuted. Thus the emigrants, who fled from the religious broils in which France, the Low Countries, and Germany have been involved, found safety in England, and introduced many of those manufactures and arts, which have contributed to the commercial supremacy of Great Britain. Newcastle, Canterbury, and even some of the most populous parts of the United States, have been founded from the productions of their inhabitants to those colonies; and, in like manner, part of Pembrokeshire, in South Wales, has been peopled by a colony from Flanders. The colonies of North America were originally planted by men who had quitted their native country, either from a love of civil and religious liberty; or from a desire to better their fortunes, by laying out a small capital in the improvement of land; or from the necessity of finding employment in a country where labour bore a high price. Anxious only to live in peace and freedom, with a competency for themselves and their families; these men centered all their views in the spot to which they removed their fortunes and perils; they gave up for ever the thoughts of returning to the countries which they left behind them; and transferred to their new homes all those ties which had formerly bound them to Europe. The woods of the northern continent were cleared by men of small capital content with a living profit, attached to the soil, which owed its cultivation to their labours, and entertaining no idea of removing from it. By degrees the influence of local attachment binds them to a spot, which need not have made the object of their choice; and in process of time the desire of depositing their bones in a country which had received and cherished them, succeeded to the obliterated partiality for the place of their birth. The first settlers of all the colonies of N. America were men of irreproachable characters, though not very enlightened in their views, or polished in their manners. Many of them fled from perfection; others on account of an honourable poverty; and all of them with their expectations limited to the prospect of a bare subsistence in freedom and peace. The greater part of them viewed their emigration beyond the Atlantic, as a taking up of the crofs; and bounded their hopes of riches to the gifts of the Spirit, and their ambition, to the desire of a kingdom beyond the grave. A set of men more confident in their doings, or simple in their manners, never founded any commonwealth. It is, indeed, the peculiar glory of N. America, that, with a very few exceptions, its empire was originally founded in charity and peace. In process of time, however, new emigrants
grants flocked to this extensive country, as it became more
open and improved, whose views, principles, and character
were very different from those of the first settlers. Many of
them were persons in very indigent circumstances; they were
different sects, or of no perceptible religion at all; and of
different nations, though the English greatly predominated.

Some of them were convicts, who after confinement in goals
were banded for their crimes; many of them persons of dif-
ferent fortunes, to whom every place was equally uninviting;
out of which indigent, indelicate, and region was acceptable, that offered them a shelter from the
consequence, or the voice of public indignation. But
a change of scene would naturally produce some salutary ef-
fect upon characters the most diffluent. This mixture of
various population was soon blended, by the influence of those
simple manners that are formed by an agricultural life, into
one nation of husbandmen, whose character has communicate-
d itself, in a great degree, to the most profligate of those
whom compulsion or defpair from time to time introduced.

While purity of manners was in this way preferred, that
format of principles in religion and policies was maintained,
which had so eminently contributed to the establishment of the
colony. Sentiments of freedom might find an asylum in
America; when, even in Switzerland, it should no longer be
lawful to think beyond the rules. Nevertheless, the circum-
stances of the N. American colonies produced some other
effects not quite so favourable, upon the table, and in what,
common conversation, we call the manners of the people.

The solitary nature of agricultural labour, and the feeling
of the husbandman's reliance, surrounded only by his own
family and servants, are very iminial to all arts of refine-
ment, and to every ornamental accomplishment; whilst the
settlers of the new colonies were occupied with the use-
ful, they neglected the agreeable arts of life; and vol-
untarily threw themselves back some centuries, in most
branches of civilization, instead of prosecuting the improve-
ments of those branches, from the point to which the
mother country had brought them at the era of their emi-
gation. In consequence of their peculiar circumstances
and occupations, the Americans have always polished a nu-
merous, virtuous, and athletic peafantry; but they have
numbered few fine artists, or accomplished orators; and, in-
deed, an ingenious writer, to whom we are much indebted
in the compilation of this article, proceeds so far as to ob-
serve, with a latitude of expression scarcely allowable, that
' the word American has never yet (so far as I know) been
coupled with either poetry, or painting, or music.' The
history of manners in N. America, says this writer, is the
general history of manners in every new community, of
which agricultural industry forms the basis. The peculiarities
(perhaps accidental), which marked the situation and
habits of the first settlers, have likewise produced some effect
upon those of their descendants, without in the least modi-
fying their character as an agricultural nation. The love
of civil and religious freedom was connected with an anxious
attention to all matters of controversy, whether in politics or
in faith; and as the settlers were equally incapable of
understanding either, so they were chiefly captivated with the
more abstruse of the two sciences; and affected great
depth in the things appertaining to grace, spirit, incarnation,
and all the sublime mysteries of the Christian dispensation.
These fruitless speculations were the only literary inher-
ance which they transmitted to their children. But al-
though they had left the old world for the fake of liberty
of conscience, they too soon manifested what they under-
good by liberty of conscience. By that term they meant
(like many other advocates of liberty) the propagation of
their own peculiar tenets; and they shewed that they only
wanted the power to propagate their creed (like their
European oppreifers) by that method of mental perfusion
which consists in burning the body. They allowed
very man entire liberty of conscience, provided that he used
that liberty in adopting their own librand of faith. Ac-
cordingly, while in Old England the spirit of fanaticism was
operating the downfall of government, and mingling itself
with every pursuit of the age, to the universal debauchement
of manners and sentiment in New England, the crosses were
perfected by the impulses of the inward light; or parties were formed, and armies marshalled, and millions led
by the subtle principles of a metaphysical theology.

The Plymouths and Sydney's had no parallels to temper the
unclassical rage of the American bigots; and even the
Cromwells and Bradfaws found but poor representatives in
the stupid fanatics of Bolton and Salem. Long after the
mother country had reinknighed, for ever, the acts of perfec-
tion, they found votaries in the constituted authorities of the
colonies; and the northern states at the end of the 17th cen-
tury, afforded the disgraceful example of that spiritual tyrany,
from which their territories had originally served as an
asylum. The century, which has just elapsed, moderated
this odious spirit; but to this day, the northern states are
chiefly distinguished from the others, by a taint of religious
bigotry; as the character of the middle states is modified
by the greater mixture of different nations, which have contrib-
uted to people them; and that of the southern
magnitudes, by the admixture of negro flavors. In the mid-
dle states, the mercantile spirit has gained more ground than
in any of the rest; the diversities of race have rendered the
sentiments of patriotism, and the love of liberty, less ardent;
while the variety of religions has prevented the introduction
of that fanaticism, of which we have traced the effects in the
north. In the southern states the contrast of servitude has
mangled an aristocratical spirit with the manners of simple huf-
bandmen; and the climate, by promoting the growth of an
article, belonging to the clafs of luxuries, has given rise to
a species of agriculture bordering upon the great gains and
uncertain prospects of commercial speculation. In all the
colonies, however, of the northern continent, a respectable
national character may be said to prevail. If their inter-
course with the mother country would have had no tendency
to civilize or adorn her, it could certainly have in no
degree contributed to the corruption, either of her moral or
political habits; and the most rapid interchange of popula-
tion could only have tended to embellish the American so-
ciety and to vary its accomplishments, while it rendered a
service to the British manners, by the intercourse of a mid-
mingle and virtuous people. Unfortunately, the very cir-
cumstances which necessarilv led the foundation of those
habits and that national character insulated the population
of the country from that of the old world. The colonics
were stationary for the same reason that they were respect-
able; and the circulation of its inhabitants, with all its ef-
fects upon both parts of the empire, has been maintained
and accelerated in other colonies, placed in circumstances
which rendered those effects unfavourable, at least to the
mother country. For the change that has taken place with regard to the principles and manners, the religion and liberty
of the several colonies of N. America, since they have ac-
quired a new government, and been formed into the United
States; see this article, and also an account of the several
states themselves under their appropriate titles.

The fourth clafs of colonies comprehends those that are
denominated commercial, and which have been establisht at
different periods, by the English, Dutch, French, Spaniards,
Portuguese, and other nations; and which are still maintained, in a greater or less degree, with a view of keeping up a regular intercourse with the natives, or of cultivating the ground, by planting sugar-canes, rice, indigo, tobacco, cotton and other commodities. See Charter Government.

The principal of this kind of colonies are those that have been established in North and South America; particularly Peru, Mexico, Canada, Virginia, New England, Carolina, Louisiana, Hudson's bay, the Antilles islands, Jamaica, Domingo, and the other islands of the West Indies, &c. in Africa, Madagascar, the cape of Good Hope, cape Verd, and its islands, and all the coasts extended thence as far as to the Red sea; and likewise in Asia, the famous Batavia of the Dutch, and Ceylon; Goa, Din, of the Portuguese; and some other less considerable places of the English, French, Danes, and other nations, in the East and West Indies.

The establishment of the European colonies in America and the West Indies, if we except those of North America to which we have already alluded, did not originate in necessity; but it was the result of ambitious and interrelated views. The Dutch, indeed, may plead in favour of the extension of their own settlements and commerce, that the colonial system is necessary to their subsistence and prosperity. Their territory is small, and generally undistinguished by its fertility; and therefore they have recourse to the necessaries of life to the ports of more fruitful and less populous countries. Habituated to industry, and excelling other nations in nautical skill, instead of confining themselves to the exchange of their own manufactures for the rude produce, or the manufactures of other nations, they employed themselves in circulating the produce and manufactures of other countries; and, more attentive to this occupation than to the arts of working up the produce which they imported or raised, they became merchants, not of farmers or manufacturers, but of fisher men, merchants, and sailors. Constrained by other circumstances belonging to their country, when compared with other nations, they were obliged, by the disadvantage of their situation and the oppression of their Spanish masters, to put forth every possible effort of fortitude and perseverance. By industry, frugality, and labour, these people not only raised and improved all their contemporaries in riches and naval skill, but amassed a much greater share of wealth, and gained a more formidable influence over the destinies of the world, than so small a tribe ever acquired in any age. Their steady attachment to the principles of freedom and toleration served as a concurring mean of their advancement and prosperity. The necessary consequence of extensive eminence, acquired by a people who have not a proportionally great territory, is, that the means of advantageously employing their capital will become gradually more and more difficult; the profits of its employment more confined, and its accumulation more slow. Such a people will naturally seek some new openings for settlement or commerce, by acquiring territory in distant quarters of the globe. Should they fail in this way, the over-flowing wealth of the nation must infallibly emigrate, as it were, into the service of foreign countries, where the profits are greater than they are at home. Hence we find that the Dutch became, in a sense, the brokers of Europe; and that they advanced sums to foreign states and their subjects, which were enormous. It is probable, says an ingenious and accurate writer, (Mr. Brougham), that the Dutch have frequently been creditors, at one time, to the amount of much more than 500 millions sterling to their own government, and to foreign states, of which we may reckon two-thirds in foreign loan: an immense sum of for- plus capital to have been accumulated by a nation possessed of no greater territory than the principality of Wales, without any good harbours, or any natural produce fit for exportation; a territory, 120 times less extensive than the European dominions of Russia, which is constant running in debt with all the world! A people possessed of such an overflowing capital, was, of all people, that which flood the most in need of foreign colonies; and this for two reasons:—in order to obtain a new opening, of whatever kind, for the stock which could not be employed at home, or which, for want of this employment, was drawn into the service of foreigners; and in order to secure the possession of this opening at all times under its own command. The acquisition of colonial possessions is the only means by which the United Provinces can possibly avoid the decline of their importance, and preserve the dignity of their public and private credit; and supply their national deficiency of territory by the cause of their inutility, as it was the cause of their rise and progress. An opening for capital may then be obtained always under the command of the state. The possession of colonies must be as advantageous to the community of the United Provinces as agreeable to individual capitalists and adventurers. It has certainly preferred the commercial existence of the republic for a long series of years, and enabled this ancient state to retain its place among the great powers of Europe instead of being swallowed up by its neighbours, or reduced to a few fishing villages. No nation of Europe depends so much upon colonial policy as Holland; nor is any thing more certain, in each member, by the slightest variation of colonial affairs. See Dutch East India Company and Dutch West India Company. The whole return of the Dutch colonies, above 20 years ago, was calculated (says Mr. Brougham) at 24 millions of florins—exported in 150 vessels, navigated by 4000 men, and paying, in freight, 4 millions 5 hundred thousand florins—commission and freight, 2½ millions. The Dutch merchants exported to them merchandise (including negro slaves) to the value of 6 millions. The most unfortunate circumstance in the colonial policy of the Dutch has always been their bad treatment of slaves. (See Negroes and Slaves.) The colonies of Holland have also suffered, in general, from the importation of negroes being too scanty to answer the demands of the proprietors. Upon the whole, it is observed by the writer so often cited in this article, that in no country is there a great demand for new colonies as in the United Provinces. To no part of Europe are colonial possessions so valuable; none would be so irretrievably ruined by their loss; none would be so much benefited by their extension.

The views of Spain in its colonial establishments were directed from the beginning of their connection with America to the pecuniary advantages likely to result from them. In consequence of the representation of Columbus, the council of Castile determined to take possession of countries of which the inhabitants were incapable of defending themselves. The pious purpose of converting them to Christianity sanctioned the injustice of the Dutch. But the hope of finding treasures of gold there was the sole motive which prompted them to undertake it; and to give this motive the greater weight, it was proposed by Columbus, that the half of all the gold and silver which might be found there should belong to the crown. This proposal was approved of by the council. The tax was easily paid whilst the defenceless natives were plundered; but as they were stripped of all that they had, which, in St. Domingo, and the other countries discovered by Columbus, was completely done in fix or eight years; and when it became necessary to dig for it in the mines, it was impossible to pay the tax. The rigorous exaction of it occasioned first the total abandonment of the mines of St. Domingo, which have never been wrought since; and it was afterwards reduced, by successive defalcations, to a tenth part of the produce of the gold mines.
miles. The tax upon silver, which was a fifth of the gross produce, was reduced to a tenth in the course of the last century. All the other enterprises of the Spaniards in the New World, subsequent to those of Columbus, seem to have been prompted by the same motive. It was the sacred thirst of gold that carried Ochoa, Nicuesa, and Vasco Núñez de Balboa, to the isthmus of Darien, that carried Cortez to Mexico, and Almagro and Pizarro to Chili and Peru. Impelled by the prospect of immense gain to establish colonies in foreign countries, the first object of the Spanish monarchs was to secure the productions of these colonies to the parent state, by an absolute prohibition of any intercourse with foreign nations. They took possession of America by right of conquest; and, having reason to apprehend the loss of their infant settlements, on account of their feebleness, their extent, and the reluctance with which the vanquished nations submitted to their dominion, they guarded, by every possible method, against the intrusion of strangers. As their possessions were extended, the spirit of jealousy and exclusion increased; and, in order to their greater security, a zymelom of colonizing was introduced, to which the history of mankind afforded no parallel. In the ancient world, as we have already seen, colonies were of two kinds; either migrations from a country overlocked with inhabitants, or military detachments, stationed as garrisons in a conquered province. The colonies of some Greek republics, and the swarms of northern barbarions which settled in different parts of Europe, were of the first kind; and the Roman colonies were of the second kind. In the former, the connection with the mother country quickly ceased; and they became independent states; in the latter, the dependence continued, because the separation was not complete. The Spanish monarchs, in their American settlements, took what was peculiar to each, and fudied to unite them. By sending colonies to regions so remote, by eflablishing in each a form of interior policy and administration, under distinct governors, and with peculiar laws, they disjoined them from the mother country. By retaining in their own hands the rights of legislation, as well as that of imposing taxes, together with the power of nominating the persons who filled every department, civil or military, they secured their dependence. At first, as we have already observed, the precious metals were the only objects that attracted their attention. Afterwards they sought for such productions of the climate as, from their rarity or value, were of chief demand in the mother country; and they forbade the establishment of several species of manufacture, that were likely to interfere with those of the mother country. Their clothes, furniture, instruments of labour, luxuries, and even a considerable part of the provisions which they consumed, were imported from Spain. In return, the colonies supplied the produce of their mines and plantations, which was conveyed only in Spanish bottoms. The commercial intercourse of one colony with another was either absolutely prohibited, or limited by many jealous restrictions. All that America yields flows into the ports of Spain; all that it consumes must likewise from them. No foreigner can enter its colonies without express permission; no vessel of any foreign nation is received into their harbours; and the pains of death, with confiscation of moveables, are denounced against every inhabitant who presumes to trade with them. Thus the colonies are kept in a state of perpetual pupilage; and by the introduction of this commercial dependence, a refinement in policy, of which Spain fet the first example to the European nations, the supremacy of the parent state has been maintained over remote colonies, during centuries. Several maxims were also adopted and enforced with regard to the restrictions of settlers, the rate of property, and the ecclesiastical policy of the colonies, which, it is evident that the Spanish monarchs, professing a country fifteen times more extensive than Holland, of innegably greater fertility, enjoying all the benefits of the finest climate in the world, surrounded with natural barriers of defence, and blessed with every advantage of situation which can facilitate commercial intercourse, and yet maintaining not much more than one-fourth of the Dutch population, are evidently independent of colonial possessions. All the induftry, skill; and capital of the natives, may find ample employment in raising, manufacturing, and circulating the produce of the soil, or in exchanging the superfluous part of that produce for the commodities which abound in other countries. But, though it would have been founder policy in the Spanish government to have promoted a spirit of industry at home, than to have established distant colonies, yet it cannot be denied, that she has received very great benefits from them, and, in their nature and value, as more than counterbalance the injury they have occasioned. At the period of their first establishment, the interior industry and manufactures of Spain were so prosperous, that, with the produce of these, she was able both to purchase the commodities of the New World, and to answer its growing demands. Under the reigns of Ferdinand and Isabella, and Charles V., Spain was one of the most industrious countries in Europe. Her manufactures in wool, and flax, and silk, were extensive, as not only to furnish what was sufficient for her own consumption, but to afford a surplus for exportation. When a market for them, formerly unknown, and to which she alone had access, opened in America, she had recourse to her domestic store, and found there an abundant supply. By this new demand, furnishing answerable employment, the spirit of industry must have been enlivened and encouraged; and the manufacture, population, and wealth of Spain might have gone on increasing in the same proportion with the growth of her colonies. However, by the great and sudden augmentation of power and revenue, which the possession of America brought into Spain, sober plans of industry were overturned, and opulence, rapidly acquired, produced a taste for what is wild and extravagant, and daring in business or in action. The genius of Charles V. in some measure counteracted the pernicious influence of this inundation of wealth and of the subsequent interruption of it; but under Philip II. its effect, both on the monarch and the people, became conspicuous. Philip, poising an extravagant opinion of his inexhaustible resources, and, at the same time, an ambition connected with moderate talents, thought himself equal to any undertaking. Accordingly he waged open war with the Dutch and English, encouraged and aided a rebellion in France, conquered Portugal, and maintained armies and garrisons inItaly,Africa, and both the Indies. Thus Spain was drained both of men and of money. Under the weak administration of his successor, Philip III., the vigour of the nation declined, and the bigotry of the monarch expelled near a million of his most industrious subjects; so that early in the 17th century, Spain felt such a diminution in the number of her people, that from inability to recruit her armies, she was obliged to contract her operations. Her flourishing manufactures were fallen into decay. Her fleets, which had been the terror of all Europe, were ruined. Her extensive foreign commerce was lost. Agriculture was neglected, and one of the most fertile countries in Europe hardly raised what was sufficient for.
for the support of its own inhabitants. In proportion as the population and manufactures of the parent state declined, the demands of her colonies continued to increase. The rage of emigration prevailed, and the strength of the colonies was augmented by exhausting that of the mother-country. The emigrants depended upon Spain for almost every article of necessary consumption. But Spain, thinned of people and delirium of industry, was unable to supply the increased demands. She had recourse to her neighbours; and the manufacturers of the Low Countries of England, of France, and of Italy, which her wants called into existence, or animated with vivacity, furnished in abundance whatever she required. In a short time not above one twentieth part of the commodities exported to America was of Spanish growth or fabric. All the rest was the property of foreign merchants, though entered in the name of Spanish; so that the trade of the New World may be said hitherto not to have belonged to Spain. Before it reached Europe, it was anticipated as the price of goods purchased from foreigners. Thus the possessions of Spain in America have not served as a source of population and of wealth to her, in the same manner as those of other nations. From the close of the 16th century she was unable to supply the growing wants of her colonies; and the pernicious effects of this disproportion between their demands and her capacity of answering them, were farther aggravated by the mode in which she endeavoured to regulate the intercourse between the mother-country and the colonies. Such was the monopoly at which she aimed, and which she wished to maintain, that she did not sell her trade with her colonies in an exclusive company; a plan which had been adopted by nations more commercial, and at a period when mercantile policy was an object of greater attention, and ought to have been better understood. The Dutch gave up the whole trade with their colonies both in the East and West Indies, to exclusive companies. The English, French, and Danes, have imitated their example with respect to their East-Indian commerce; and the two former have laid a similar restraint upon some branches of their trade with the New World. The wit of man cannot, perhaps, devise a method for checking the progress of industry and population in a new colony, more effectual than this. From this error in policy Spain was preferred, probably by the high ideas which the early formed concerning the riches of the New World. Gold and silver were commodities of too high value to veil a monopoly of them in private hands. The crown retained this shining branch of commerce; and in order to secure it, enjoined the cargo of every ship fitted out for America to be inspected by officers at Seville, and then to receive a license for the voyage; and on its return, that a report of the commodities which it brought should be made to the same board, before it should be permitted to land them. By this regulation all the trade of Spain with the New World centered in the port of Seville, and was brought into a form, in which it has been continued with little variation, almost to our own times. See GALEONS and FLOTA.

The trade of Spain with her colonies being thus restricted, was conducted on the same principles which directed that of an exclusive company; and the whole of it was exported by a few wealthy houses, formerly in Seville, and since the year 1720 in Cadiz; there, by combinations easily formed, prevent that competition which prevents commodities at their natural price; and, by acting in concert, to which mutual interest prompts them, they may raise or lower the value of them at pleasure. This restraint of the American commerce to one port, not only affects its domestic list, but limits its foreign operations. In these circumstances, and whilst the evils resulting from them found no effectual remedy, Spain, with dominions more extensive and more opulent than any European State, puffed neither vigour, nor money, nor industry. At length the violence of a great national conventionrouzed the lumbering genius of Spain. As soon as the Bourbons acquired possession of the throne, it was the first object of Philip V. to prohibit the admission of foreign vessels into any port of Peru or Chile; and a Spanish squadron was employed to clear the South Sea of intruders, whose aid was no longer necessary. After the treaty of Utrecht, which terminated the war, new embarrassments occurred in consequence of the amities, or contract for supplying the Spanish colonies with negroes, conveyed to Great Britain, as the price of peace; (See ASSIST) and the additional privilege of sending annually to the fair of Porto-Bello, a ship of five hundred tons, laden with European commodities. By the operations that succeeded these grants, and by the activity of private interlopers, almost the whole trade of Spanish America was engrossed by foreigners. Guardia collars, and regular ships were introduced. (See each of these articles.) Since the reign of Philip V., sentiments with regard to commerce, more liberal and enlarged, began to spread in Spain. At length Charles III. in 1764, appointed packet-boats to be dispatched on the full day of each month, from Corunna to the Havana, or Porto-Rico. From thence letters are conveyed in smaller vessels to Vera-Cruz and Porto-Bello and through the kingdoms of Terra Fomé, Granada, Peru, and New Spain. Other packet-boats sail regularly once in two months, to Rio de la Plata, for the accommodation of the provinces to the east of the Andes. With this new arrangement for conveying speedy and regular intelligence, a scheme of extending commerce has been more immediately connected. Each packet boat is a trading vessel, and is used for facilitating the exchange of Spanish produce, for an equal quantity of that of America. This was soon followed by a greater degree of enlargement. In the year 1765, Charles III. laid open the trade to the windward islands, Cuba, Hicpanion, Porto-Rico, Margarita, and Trinidad, to his subjects in every province of Spain. He reduced the duties on goods exported to America, to the moderate tax of fix in the hundred, on the commodities sent from Spain. He allowed them to return to any port at pleasure. This ample privilege was afterwards extended to Nornifranza, and to the province of Yucatan, and Campuchey. Such have been the benefits experienced from the relaxation of the ancient yolk of commerce between the mother-country and her colonies, that Spain has been induced to permit a more liberal intercourse of one colony with another. In 1774 Charles III. published an edict, granting to Peru, New Spain, Guatemala, and Granada, the privilege of a free trade with each other. The towns to which Spain has granted the liberty of trade with any of her colonies, are Cadiz and Seville, for the province of Andalusia; Alicant and Cartagena, for Valencia and Marcia; Barcelona, for Catalonia and Aragon; Santander, for Cantile, Corunna, for Galicia; and Gijon, for Asturias. These are either the ports of chief trade in their respective districts, or those most conveniently situated for the exportation of their respective productions. Prior to the allowance of free trade, the duties collected at the Cadiz-honfe at the Havana, were computed to be 104,725 pesos annually. During the five years preceding 1774, they rose at a medium to 308,600 pesos a year. In Yucatan, the duties have risen from 8,000 to 15,000. In Hicpanion, from 2,500 to 5,000. In Porto-Rico, from 1,500 to 7,000. The total value of goods imported from Cuba
Cuba into Spain, was reckoned, in 1774, to be 1,500,000 pesos. From another statement, it appears, that the exports to Spanish America in 1778, were made in 170 ships; were worth about 74 millions of reals vellor, and paid above 3½ millions of duty. The imports from thence, in the same year, were made in 130 ships, valued at 74½ millions, and paid nearly 3 millions duties. In 1785, the value of the exports had risen to above 300 millions, and of the imports to above 834½ millions. The duties upon these exports and imports exceeded 55 millions. This rapid increase can be ascribed to nothing but the effects of the free trade; and notwithstanding all the clamours raised by the Cadiz merchants, we find that this city was the first to enjoy the advantage of the change; for the imports of Cadiz from America, in 1788, were three-fourths of the whole colonial imports; and the exports of Cadiz thither were considerably above two-thirds of the whole colonial exports.

Spain has likewise directed particular attention to the interior government of her colonies. For an account of the Philippine colony, see ACAPULCO and MANILA.

The revenues which Spain derives from America, arises from taxes of various kinds, which may be divided into three capital branches. The first contains what is paid to the king, as sovereign of the New World; to this belongs the duty on the gold and silver raised from the mines, and the tribute exacted from the Indians; the former called "the right of figueroa," and the latter "the duty of vassalage." The second branch comprehends the numerous duties upon commerce, which are very minute and oppressive. The third includes what accrues to the king, as head of the church, and administrator of ecclesiastical funds in the New World. In consequence of this he receives the first-fruits, annats, spoils, and other spiritual revenues, levied by the apostolic chamber in Europe; and is entitled likewise to the profit accruing from the bull of Crusade, which fee. The whole amount of the net public revenue of Spain, raised in America, is stated by Dr. Robertson as amounting to a million and a half sterling. Spain and Portugal are the only European powers which derive a direct revenue from their colonies, as their quota towards defraying the general expense of government. All the advantages, that accrue to other nations from their American dominions, arise from the exclusive enjoyment of their trade; but, besides this, Spain has brought her colonies to contribute towards increasing the power of the state, and, in return for protection, to bear a proportional share of the common burden. The amount of the Spanish revenue, above stated, comprehends only the taxes collected there, and is far from being the whole of what accrues to the king from his dominions in the New World. The heavy duties imposed on the commodities exported from Spain to America, as well as what is paid by those who trade in return; the tax upon negro slaves, which Africa supplies the New World, together with several smaller branches of finance, bring larger sums into the treasury, the precise extent of which Dr. Robertson cannot pretend to ascertain. But if the revenue which Spain draws from America be great, the existence of administration in her colonies bears proportion to it.

The total amount of the public revenue of Spain from America, and the Philippines, from the most recent information stated by Dr. Robertson, is as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount (in Thousands of Pesos)</th>
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</thead>
<tbody>
<tr>
<td>in pesos fuertes</td>
<td>2,500,000</td>
</tr>
<tr>
<td>Duties on gold and silver</td>
<td>3,000,000</td>
</tr>
<tr>
<td>Bull of Cruzado</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Tribute of the Indians</td>
<td>2,000,000</td>
</tr>
<tr>
<td>By sale of quicksilver</td>
<td>300,000</td>
</tr>
</tbody>
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Paper exported on the king's account, and sold in the royal warehouses, - - - 300,000
Stamped paper, tobacco, and other small duties, - 1,500,000
Duty on coinage, at the rate of one real de la Plata, for each mark, - - 300,000
From the trade of Acapulco, and the coasting trade from province to province, - 500,000
Affitto of negroes, - - 200,000
From the trade of Mâthi, or herb of Paraguay, formerly monopolized by the Jefuits, - 500,000
From other revenues formerly belonging to that order, - - - 400,000

Total 13,000,000

Deduct, half, as the expense of administration, and there remains net free revenue, - 6,500,000

From the above detail, and upon a general view of the subject, it appears to be absurd to deny, that Spain has derived very great benefits from her colonial possessions. Nevertheless, many very enlightened men have maintained, that the downfall of the Spanish power has been owing, in a great measure, to the extension of dominion which followed the discovery of America. To this purpose an appeal has been made to the authority of Dr. Smith, the well known and much approved author of the "Wealth of Nations," "That the monopoly," he observes, "of the trade of populous and thriving colonies is not alone sufficient to establish, or even to maintain, manufactures in any country, the examples of Spain and Portugal sufficiently demonstrate. Spain and Portugal were manufacturing countries before they had any considerable colonies. Since they had the richest and most fertile in the world, they have both ceased to be so." However, Mr. Brougham has remarked, that the tenor of this observation is confined to the statement of a fact which cannot be denied, that the period of the decline which the Spanish and Portuguese manufactures have experienced, coincided with the period of the Spanish and Portuguese colonial greatness. But the whole argument proceeds upon a view of the subject, formerly discussed, that colonial monopolies in general have been hurtful, from their effects on the wealth of the mother-country. Mr. Brougham has accurately examined this subject; and in the prosecution of his inquiry, he has shewn, in what manner the prosperity of Spain has been influenced by the discovery of America; and he has investigated the question, whether the acquisition of rich and extensive colonies can be charged with having caused the decline of the mother-country, and whether, in short, any bad consequence whatever is imputable to this augmentation of empire.

By those who have maintained, that Spain has been materially injured by her colonies, it has been alleged, that by an immoderate extension of territory, the Spaniards have been led to the neglect of the territory, which they formerly possessed. But although Spain, and also Portugal, may have feebly suffered in this respect, it is seldom, if ever, that, from the nature of colonial power, any such consequences can arise to the mother-country from the possession of the most widely spread colonial dominions. In the case of Spain especially, whatever neglect there may have been in the management both of the mother-country and the colonies, the mal-administration of both parts of the empire must evidently have arisen from other causes besides their being united under one crown. Farther, the vast outlet to population which the Spanish colonies
 Colonies afford has been thought by many to be detrimental to the mother-country. They allege that the population of Spain has been drained by the demands and temptations for men which the colonies afford. Our author suggests a variety of considerations that tend to invalidate this objection. The indolent and adventurous, the nobles and soldiers of fortune, and men of considerable property, were the principal emigrants at the first settlement of the Spanish colonies in America; as conquest or plunder, and mining in search of the precious metals were the only modes in which wealth was then sought. Besides, the drain of emigration has been chiefly confined to the population of the maritime provinces of Spain; as the annual amount of the emigration in different periods, cannot be estimated very high. It has been said that the rage for emigration to America was so much abated in a short time after the discovery, chiefly by the ruin of many who flecked thither, that in the year 1550, there were not above 15 thousand Spaniards in all the New World. From other documents it has been inferred, that the whole amount of those who have emigrated to the Spanish colonies, during a period of three centuries, does not exceed 500,000. The drain of the Spanish population must therefore be wholly inadequate to account for the decline of the Spanish resources, and the flow of the Spanish population. It is no less censurable to imagine that the capital which has been drawn to the colonial agriculture and mining, can have impoverished the mother-country in any considerable degree, than to suppose that the colonial emigration has drained her population; and it is, therefore, to causes different from the emigration of inhabitants, and of capitals, that we must attribute the depopulation, the indolence, and the poverty of Spain. In order to account for the depopulation of Spain we may recur to the ravages of the plague, which, during three centuries, was more fatal than the conquest of the colonies. The conquest of the colonies, in the middle of the 14th century, carried off two-thirds of the whole population of the peninsula, and which about three centuries afterwards, destroyed 200,000 persons in the southern provinces;—to the destruction occasioned by dearth and famine;—to the cruel and infaile policy of Ferdinand, who, as an expression of gratitude to God for the successe of his arms, expelled from his dominions the whole tribe of Israel;—to the still more bloody and impolitic measures of his successor, who, about a century afterwards, drove out all the Moors, and unites the western races;—and to the constant persecutions and rebellions of those two classes during the interval between the great and general expeditions, which produced the effect of suddenly eradicating from the kingdom all the industry and skill which had raised it to such a pitch of opulence and glory. The number of the Jews, who, in the year 1492, were butchered or driven out, is reckoned by some authors at 800,000 persons, by others at 800,000 families; and the number of the Moors driven away by the edict of 1609, cannot be computed at less than a million. The best informed writers flate that of the editions and intervening intervals, have amount ed to between two and three millions; confining of the most useful and valuable part of the community. We might enumerate other causes of the decline of Spain, arising from restrictions and impotts, and a miserable system of law and politics, both at home and in the colonies, which operated much more fatally than the acquisition of colonial dominions, and which, indeed, counteracted any benefit they might otherwise have afforded. It is surely a proof, says Mr. B., that the downfall of a country was not caused by its colonial possessions, but by some evil in the national policy common to all its branches, when we find that the era of adversity was common to both the contiguous and remote provinces, and that the same circumstances which raised up the colonies,
foreign conquest, may convince us of the important relations which the provincial wealth and power of this nation must have formerly borne to its whole resources. The East Indian possessions of Portugal, during the 16th century, threw into their hands the whole commerce of Asia, which, long before the discovery of the passage by the Cape of Good Hope, had formed one of the greatest trades carried on between any two parts of the world; had enriched and refined the whole European empire of Rome, and raised the inconsiderable republic of Venice to a degree of power formidable to all the great nations of the continent. The same commerce, divided among several states, has, since the downfall of the Portuguese dominions, fabulously enriched all those nations, and continues to form a very great part of their extended trade. We may judge, in some degree, of the extent of the trade carried on by the Portuguese in their Asiatic settlements, some time after their eastern empire had begun to decline from the completion of the English and Dutch, by a single fact. In the year 1611, the English company's servants, in one of their voyages to Surat, found a single Portuguese merchant fleet, consisting of 240 sail, bound for one place, and destined only for the commerce of the northern and most thriving settlements. (Anderson's Hist. of Commerce, ii. 245. 263.) The African and Asiatic provinces, however, must be considered as conquered territories, held in subjugation by a few troops and squadrons of ships; not as colonies peopled by emigrants from the mother country, or by a race in which those emigrants and their descendants bore a considerable proportion. Of these vast dominions the Portuguese were nominal possessors; the treasure and blood of the metropolis were wasted in wars with the native powers, and the relations of commerce were on every occasion postponed for those of conquest and dominion. Those circumstances have eventually proved fatal to the Portuguese dominion in the East, which has at length been transferred to others powers of superior policy and strength.

The Portuguese trade with India, though rigorously confined to the subjects of the mother country, was never put into the hands of an exclusive company, incorporated by charter, except for a short time, about the year 1731, when the experiment was un successfully tried. The sovereign granted, from time to time, privileges of sitting out vessels, under limitations, to private co-partners and individuals, who thus enjoyed a monopoly of the supplies required both by the Asiatic and European provinces. The monopoly had been generallyotted in the crown, until the year 1752, when it was fixed to be abolished; but several important articles still continued subject to the royal privileges, and could only be bought in India and sold in Europe on the king's account. From the splendid pre-eminence which the Portuguese trade with India once possessed, it has sunk to a few annual voyages, in consequence of the reduction of the Portuguese empire in the East, and the bad management of the trade and settlements that still remain. With a view to its revival, new exclusive grants have been made to mercantile adventurers in Europe, and an exclusive company has been established at Goa (the chief East Indian settlement) for the management of the whole trade with Chins. These abundant measures have taken place since the year 1752, when the evil perceived to arise from monopolizing policy, induced the sovereign to abandon several of his exclusive rights, and to pretend that the East Indian commerce was thrown open. While the Portuguese conquests were rapidly subsiding each other in the East, the discovery of Bengal, opened a new field of exertion in the West. Brazil, however, compared with Asiatic conquests, was regarded with indifference, and slowly peopled by malefactors, and by those whom the perverting spirit of the times drove, from the mother-country. Among the emigrants of this period, sacrificed to the cruel bigotry of the inquisition, was a great body of Jews, who carried over with them to the colony the skill and industry with which they had enriched and strengthened the European dominions of Portugal. Under their cultivation the natural wealth of this fruitful territory began to appear, and by degrees to attract the attention of government. All the Portuguese subjects, who chose to settle in Brazil, were permitted to subsist large tracks of country, and to hold them as fiefs of the crown, with absolute power over the natives whom they had conquered, and with all the prerogatives of royalty, except capital jurisdiction, coinage, and tithes, which were invariably referred to the sovereign. These great territorial lords thus acquired an almost absolute authority, over domains often extending 40 or 50 leagues along the sea-coast; and generally leased out parts of their possessions to sub-fiefolds for terms of 2 or 3 lives. This arrangement immediately attracted to the colony a number of adventurers and opulent persons from the mother country. The importance of this colony, in consequence of the whole territory of Brazil, and the cultivation of various useful articles, gradually increased; and its traffic with the parent state, would have proved a great mutual benefit; if an erroneous policy had not confined it to a few ports in each part of the empire. Annual fleets from Lisbon and Oporto alone were permitted to carry on this rich commerce, under regulations similar to those of the Spanish fleet and galleons. Four emporiums, viz. Olinda, St. Salvador, Paraiba, and Rio Janeiro, were appointed for the designation of thefe squadrons, and the supply of the whole colony. The 18th century opened with a discovery of gold and diamond mines; and since that period many regulations have been adopted, which have proved pernicious both to the colonies and to the parent state. Companies were established at Peru, Fernambuco, and Maraguan, which did not long survive the downfall of Pombal, the Portuguese minister: there have ceased to exist above 20 years, after proving highly injurious to both the mother country and the colony during an equal period of time. A new and more liberal system has been introduced; but the royal monopolies still exist in their full force, and obstruct the growth, as well as the circulation, of the most valuable staple produce which Brazil supplies. Since Portugal has experienced the irretrievable loss of her rich East Indian commerce, and a diminution of the traffic formerly carried on with Africa, Brazil is of great importance to her. This colony is better governed and peopled than any of the Spanish dominions; its proximity to Africa and connection with the Portuguese settlements there, afford great facility in the increase of its cultivation, by means of negroes; the possessions of Brazil gives Portugal considerable weight in the Continental politics; and the possession of this noble colony, besides yielding a clear revenue to the mother-country (above one-fourth of the whole national income) is the source of a great proportion of her whole commerce—the imports from them being nearly equal to the whole imports from the other countries of Europe.

The colonies of Sweden and Denmark, are too insignificant to influence, in any considerable degree, the prosperity of the parent states, and bear a less proportion to the whole imperial resources than those of any other nation. The exclusive companies, which for a long series of years monopolized all the colonial trade of both these countries, have been peculiarly injurious. See Company, Dominions, and Swedish.
For an account of the colonies of France and England, the limits of our article oblige us to refer to the article France and England, West Indies, East Indies, and Company, and the several individual islands of the West Indies.

There are some other kinds of colonies, besides those above enumerated, of which we shall give a brief account. Conquered subjects or prisoners of war have been sometimes removed to particular and distant places, either for safe custody, or for the cultivation of waste lands. The ancients more frequently practised this species of colonization than the moderns, who prefer exchanging the prisoners on each side. The Romans, in particular, were constantly accustomed to remove the more active and daring nations to a distance from their native abodes, and to oblige them to reside in some select place which was probably less defensible than their own country, and where, of course, they would be more under command. We are not, however, without some examples of this kind, even in our own times. The Maroons, or remnant of the Spanish slaves, who had been relinquished by their masters, and left on the island of Jamaica, when the Spaniards were expelled by the English, after having long gallantly refitted the forces brought against them, at last submitted to one of his majesty's officers, upon condition of not being sent off the island. To this submission they were induced by the fear of a new species of warfare with which they were threatened, viz. the use of blood-hounds to discover their retreats. But the legislative assembly of the island not only refused to pay the Spanish police-runners their stipulated bounty, but also took advantage of some unavoidable delays in the performance of the treaty to annul it altogether, and to transport the Maroons to Nova Scotia, whence they were afterwards removed to Sierra Leone. On account of this flagrant act of injustice the commanding officer of his majesty's troops indignantly refused a hand- some reward, which the assembly offered him for his services in putting an end to a war which had been so long protracted. See MAROONS.

Another kind of colonization is the removal of convicted criminals, or of debtors, to some desert spot, in order to work the mines, or break up the land, and thus prepare it for more respectable colonists. The Russians use this mode of colonizing their vast lands in Siberia. But the most interesting colony of this description, particularly to Englishmen, is that of New Holland, which lies—Also Botany Bay and New South Wales.

Great sums of money have been, and still are, annually expended on this colony, but it has hitherto languished; partly from the disproportionate number of the sexes, and the idle habits of the convicts, but still more from some radical defects in its administration, many parts of which render it more like a mere job for contractors and agents, than a well regulated system for the gradual reformation of the criminals, and for rendering them useful subjects in future. The dilations also which have taken place among the officers there, cannot but have tended to injure the colony. These dilations seem to have originated in some measure from the governor being always a naval officer. The abridgment, for such we must esteem it, of a naval officer commanding in chief on shore, merely because he went to the place by sea, is fully equalled by several others, which demonstrate how inadequate to the undertaking were the framers of the system by which the colony is regulated.

During the first ten years, viz. from 1787 to 1797 inclusive, the number of convicts sent to New South Wales was 5765 men and women, and 93 children, being in all 5855 persons. The expense of transporting, feeding, and governing them, during that period, amounted to 1,087,250l. being above 177l. for each, exclusive of the expenses previous to their embarkation.

The number of convicts remaining was as follows:

- Men convicts in the settlement - 2715
- Women - - 939

Convicts sent out in 1796 and 1797:
- Not arrived - - 605

Total - 3802

So that a large of 2849 convicts had been confined in this short period; an evident proof of the most gloomy mismanagement. On the first of September, 1798, the agricultural state of the colony was as follows:

- Acres of land in cultivation - 1700
- Thores - - 14
- Black cattle - - 130
- Sheep - - 197
- Goats - - 111
- Swine - - 59

The later accounts which have been received are equally unpromising. The spirit of dilution has increased, and spread itself to every rank; so also has the depravity of the convicts, in consequence of their not being separated, and placed under the control of steady persons who have an interest in watching over their moral improvement. Indeed, the misfortunes of the convicts increased by fellowship, and even many of the free settlers have, from the force of evil example, acquired the same bad habits. The quantity of land cultivated on the public account is too great, and the numerous public works absorb the labour of the convicts, and leave but few of them to be hired out to settlers. These circumstances, together with the ill selection of the convicts, and of the settlers, as to their former employments, contribute to the want of success in the colony.

It certainly is not improper to fend, as matter of favour, criminals to remote and desert places to procure their own livelihood, furnishing them at first with a few necessaries, and then leaving them to their own industry; or to supply the free settlers in those places with convicts for servants, in order to give them from the heavy expense incident to their procuring servants from a distance. But the idea of transporting large bodies of criminals to an immense distance, and employing them, under a strong guard, in public works, where few such works can possibly be wanted, and in cultivating land in the produce of which they have no interest, does not seem to have been happily chosen, or very promising, even in theory; and we may add, that practice, upon a very extensive scale, has completely flown its object.

The Romans, it is true, transplanted their prisoners of war to distant countries, and employed them on public works; but those works were carried on in well inhabited countries, and were designed for the facilitation of the intercourse between the several parts of the empire, or for adorning the cities with marks of the Roman grandeur.

We believe, however, that the colony of New South Wales might be made to answer much better, if a few simple regulations were adopted, and particularly if the employment of so many convicts on account of government was abolished, and the convicts left more to their own industry.

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It was formerly observed in Virginia, that the colony languished so long as the cultivation of the ground, &c. was carried on as a public concern, but that it immediately began

to flourish when the lands were divided, and every one left to shift for himself.

The want of capital and experience among the majority of the convicts, forms no objection; as, by furnishing those accustomed to husbandry, gardening, or useful trades, with the necessary fees and tools, and a very sparing allowance of provisions, to be gradually diminished, there can be no doubt but that, in a very short time, they would not only be able to repay the advances made them, with interest, but also pay a gradually increasing rent. As to those bred to no profession useful in the colony, they might be let out by auction, for a year at a time, until they had acquired sufficient experience; and a fourth part of their wages might be deducted and laid by, to form a stock when they were capable of using it, another part being paid into some benefit society.

Hitherto we have spoken of external colonies, or those in which the colonists recede from their mother-country, and establish themselves in foreign land, without, however, submitting to their form of government.

It now remains to treat of those colonies in which large communities of foreigners are, for some particular reasons, permitted to enter and settle in a country; which colonies differ from those founded by private adventurers, only because they do not so strongly affect the political system of the country.

The Ruflian government, having immense tracks of waste lands, some of which are advantageously situated for mines or for commerce, has, as we have already said, bellowed great attention in endeavouring to people those tracks, as well by foreigners as by natives. The Prussian government has also induced the same laudable attention to the improvement of the waste lands in its possion; and it even went so far as to require from the Poles a tribute of marriageable virgins, with a stipulated portion for each.

To this species of colony belongs what is usually called the Babylonian captivity of the Jewish nation, and which is erroneously supposed to have been a removal of the whole nation in a state of slavery; whereas it evidently appears, from their own records, that it simply meant the residence of the Jewish chiefs, and of their priests, at the court of the king of Babylon. The number of persons carried off by the king himself, was (2 Kings, xxiv.) only 10,000; a number surely applicable only to the higher classes. The officers which many of them held in the Babylonian court, and subsequently in the Persians, are a proof, that although they were, for obvious political reasons, required to reside at court, their situation there was perfectly honourable. It is probable, however, that their removal might occasion the gradual emigration of a number of other families, who followed them for the sake of employment, and spread over the Babylonian dominions; as their number was found to be greatly encresed, when they were allowed by the Persians to return. They then amounted (Nehemiah, vii. Ezra, i.) to 49,697 persons.

Many other instances may be found, both in ancient and modern history, of this importation of people. The conquered Greeks filled the capital of the Roman empire, and, by the virtuosity of their talents, acquired the same influence over the masters of the world, as the modern French, (who frequently boast of their Grec origin) have over the fashionable part of our own country. By means of this influence, they introduced among the Romans all the vices for which they were notorious; and to the baneful effect of their influence, we may judiciously attribute, in great measure, the downfall of the empire, since they introduced a love of dissipation, and of slowy, but trifling acquisitions, instead of the more solid attainments which were required, before they contaminated the public mind.

The importation of slaves into a country, may be regarded as a kind of internal colony of the most important, because dangerous nature. When the slaves are numerous, they are not only retained in subjection with difficulty, being in general far superior in bodily strength but they are also of very doubtful fidelity, and ever ready to join any invader, or to flock to the standard of any military adventurer. There is yet still greater danger in an independent state exists in the neighbourhood, and particularly if it should consist of revolted slaves (as has lately happened in St. Domingo), because the greater energy of an independent government enables it to prosecute any ambitious designs of conquest with decided advantage over a delegated authority.

It is, therefore, highly politic that slavery should be constantly permitted in any country; and, although, for the sake of bringing labourers to any particular spot, it may be tolerated at first, it is the bounden duty of every state to take decisive measures to convert the slaves, by degrees, into free subjects, and to put a stop to the importation, as soon as the colony has obtained a certain population, and further to take some steps in order to liberate the slaves already imported, or at least to make their servitude free at a certain age. Thus it will be requisite for the colonist to attend to the welfare of his present flock, and to introduce talk-work, whereby he will be changed, in time, from a commercial capitalist, or a needy planter, into a landed gentleman. He will then be solicitous only for his rents, and deprecate the idea of keeping more land in hand than is necessary for the support of his establishment, or to serve as an example of perfect cultivation and grazing to his tenants, to the most indolent of whom he might furnish capital and favourable leaves, in order to enable them to improve his own land.

To a neglect of this salutary precaution, we may attribute the present dangerous state of the Dutch and English colonies in the West Indies, since, notwithstanding the length of time that they have been established, the state of society in them is as crude and semi-barbarous as it was at the time of their being first settled.

It was probably owing to a similar neglect that the western provinces of the Roman empire were so speedily subdued by the northern adventurers. The Roman provincials, like the planters in the West Indies, seem to have had little repugnance to a change of masters; partly because the resident planters were thus relieved, at least for some time, from the claims of their creditors; partly because the agents were enabled, in many cases, to convert the plantations to their own benefit; and, lastly, because both were equally afraid that, in case the war was protracted, they should lose their slaves. See Slaves.

As to their intrinsic nature, colonies are either agricultural, which grow within themselves the principal articles of their food and subsistence; or they are commercial, which depend upon other countries for the necessaries of life, and devote themselves to the traffic of a few staple commodities. The northern states of America and the Bermuda islands are so many instances of agricultural colonies; while the West Indian islands, together with Virginia and Maryland on the continent, are examples of commercial colonies.

In respect to the advantages or disadvantages of external dependent colonies, no person has more thoroughly con-
dered the subject than Mr. Brougham, in his elaborate treatise "On the Colonial Policy of the European Powers." The adoption of all the positions advanced by that ingenious writer, may indeed be somewhat hazardous; especially if we consider the great degree of doubt and uncertainty which hangs over all political speculations, on account of the difficulty, and still more the danger of making experiments on those subjects; to lay nothing of the want of means for ascertaining whether the effects are ascribed to the right causes, when (as is usual in human affairs) so many causes concur in producing those effects.

The first advantage arising from colonies is, as has been said, the extension of the home trade; for such in fact the trade between the mother-country and the colony may fairly be considered, because the whole of the profits is retained within the state; whereas in foreign trades, one of the profits, either that of the buying, or of the selling merchant, goes to enrich a foreign state. The trade of a colony also produces a considerable augmentation of the mercantile navy of the mother-country, and, at the same time, as the ships and their crews are constantly retained within the power of the state, there is far less danger of the sailors being enticed into foreign service, than if part of their time was spent in foreign ports. The European nations have anxiously endeavoured to confine the trade of their colonies to the merchants of the mother-country by positive regulations; but Mr. Brougham thinks this solicitude is absurd and even nugatory. Merchants will, in all countries, prefer dealing with their own countrymen, with whom language, laws, and habits of thinking they are acquainted. And this is more especially the case in commercial colonies, as they require in general such large advances of capital, that few persons would be inclined to invest sums upon private foreign security.

But the greatest utility of colonies, is the ascertaining an opening for the employment of the superfluous population of the mother-country, which must otherwise either emigrate to the neighbouring foreign nations, or die of want at home. The inhabitants, indeed, of agricultural colonies, are in general stationary, and, as it were, lost to the mother-country; but these colonies only attract those who cannot get employment at home, or in the commercial colonies, or those who are in such desperate circumstances that they are obliged to fly from home to avoid the hardships of their creditors. Commercial colonies, on the other hand, have for the most part only a temporary population, as the colonists, after spending a part of their time in the colony, generally return home with their fortunes improved, and carry with them, to the mother-country, the same spirit of improvement to which they owed their success in the colony.

Commercial colonies have a further advantage, in furnishing employment for those large capitals which would otherwise be employed upon the more distant foreign trades, or lent to foreign states.

We shall now say a few words respecting the disadvantages arising from the possession of colonies; these are so great that the economists have loudly declaimed against the utility of forming such establishments; but they have committed a fundamental error, in considering colonies as foreign states. They ought rather to be considered as mere extensions of the parent state, into regions adapted to the production of articles which cannot be raised at home. A circulation of inhabitants is kept up by the commercial intercourse between the colony and the mother-country, and also by the weaklings incident to parts remote from the seat of government. So that, as the colonies require, at all times, the fostering care of the mother-country, they are generally filled with the troops of the parent state and their followers, and the ports are constantly referred to by its shipping, both mercantile and warlike. It were needless to infilt upon the powerful attractions resulting from their common origin, their identity of language, and their similarity of habits in thinking; as the effect of these, in producing a good understanding among nations, must strike the most inattentive observer.

One of the principal disadvantages of colonies, is the wars into which they seem to draw the nations which possess them. But although it is certainly true that external commercial colonies draw, in the present times, generally the force of war from one of the belligerent powers as polishes them, it is not always that they are the causes of the war; for as they increase the frontier to be defended, those nations which possess them will be less ready to engage in hostilities; and it is the weakness of the colonies, (on account of their deficient population preventing the raising of regular troops in them), that is the principal cause of the enemy chusing rather to invade them, than to force his entry into the parent state. The want of a powerful landed interest, in colonies of this nature, tends also to attract the hostilities of the enemy, as the possession of them is seldom disputed with the obstinacy which marks the resistance to invasion in old settled countries; the defence being limited to the small number of troops which the parent state can spare without endangering her own safety, and whose exertions are impeded by the mixture of an ill disciplined militia, and of volunteers, unacquainted to service, and deploring their fate in being forced from their own homes.

This unfruitful of external colonies, which are always underocked with inhabitants, to contribute supplies of men for the general defence of the state, is usually considered as a disadvantage; but it cannot in reality be deemed to be one of much consequence. Even in the parent state itself, it is only in those manufacturing districts that produce articles, the demand for which is variable, that the recruiting service meets with success; in those where agriculture prevails, or in which a staple commodity is manufactured, that service is in general unsuccessful. It cannot, however, be of any consequence, in regard to the general population of the empire, whether the mother-country supplies soldiers, or whether they are raised in the colony, and their place supplied by fresh settlers.

It is only the total want of supply, both in the planting and subsequent management of the English colonies, that rendered them at first, and still keeps several of them expensive burthens to the mother-country; as those of other countries not only pay, in general, their own expences, but also furnish a surplus revenue for the service of the empire.

It will appear, from what we have already said, that a great difference of political strength subsists between agricultural and commercial colonies. The former are much stronger internally, and capable of affording, with their own resources, a more obdurate defence to the attacks of the enemy. But this strength renders them refractory, and difficult to be controlled; hence they require either early restraint, and the observance of a strict discipline, or they must be relinquished as dependencies, and incorporated into the mother-country, as has recently been found necessary in respect to Ireland. On the other hand, although the weaknesses of commercial colonies renders them much more dependent on the state to which they belong, yet, from the debts with which they are in general loaded, they are ever ready to submit to any invader; especially if the change can be made to a state, where the merchants possess larger
Larger capitals than those of the flate to which they have already been subjected; as this affords them a hope, not only of being released for some time from the claims of their ancient creditors, but also gives them reason to suppose they may be able to procure still greater credit from their new masters. Every person acquainted with West Indian affairs must acknowledge the truth of this remark; and with respect to other parts, we have, ourselves, twice experienced the facility and even eagerness with which the Cape of Good Hope was surrendered to us.

The want of mercantile capital, which our enemies in the West Indies do not as yet possess, is the principal security we have that those colonies will rather chafe to remain under our dominion than fall into the hands of other powers, as they would, in that case, be obliged to diminish their cultivation in consequence of the diminution in the advances made by the merchants upon their future crop. And as to any attempts at independence, the mother-country has a considerable security in the precarious situation of the inhabitants, in consequence of the number of their slaves and the discontent that generally prevails among them. This latter circumstance, might, by those who think the possession of colonies, and the monopoly of their trade, are of great benefit to a nation, be thought to afford a good argument against the abolition of the slave trade, as tending indirectly to lefen the dependency of the colonies. But we may remark, that the greater strength of the colonies, arising from their internal improvement in consequence of the abolition of the slave trade, would make more than counterbalance the danger of their revolt, as they would, in consequence of such strength, run less hazard of falling into the hands of an enemy. And the event of the American war has fully proved, that even in the case of the colonies revolting, when they had acquired sufficient strength, the commercial intercourse between the two countries would continue, and probably rapidly increase; so that the government would, at the worst, lose only an expensive incumbrance. It can only be by the influx of foreigners, belonging to a mercantile nation, in such numbers as to acquire a preponderance in the state, so as to alter the fundamental laws and language of the colony, that any great change in its commercial relations would be effected.

The most serious disadvantage of colonies, is that they divert the capital of the nation from the improvement of the mother-country; although this improvement is certainly the most advantageous employment in which the capital of any nation can be engaged. It has indeed been asserted, that the labour of one man on the continent of America, produced more to the state than four at home; but this must be regarded as the mere rant of visionary politicians, being totally unfounded and absurd in the highest degree; for the subject at home being directly taxed, must yield far more revenue than those in the colonies, who are in general only indirectly taxed to the common service of the empire, by the cullums levied upon the commercial intercourse of the two countries. The fame perons asserted that each white person in Virginia and Maryland, took off from ten to twelve pounds a year of the growth or manufactures of the mother-country. But the cullum-horse books are sufficient evidence that this calculation was much over-rated; for the exports to those colonies were never more than 300,000l. a year, and therefore, allowing them to contain, as was stated, 120,000 white persons, the consumption of each person was only 1l. 13s. 4d. a head. The whole of the exports to America, when at the highest, was only about 834,000l. a year; and this tends to shew that it is better to retain the industry of the inhabitants of any country within its own sphere, and encourage the cultivation of the wakle lands, than to divert it to distant colonization. It may, however, be sometimes necessary, as a measure of precaution, to secure the possession of distant places, when it is known, or suspected, that the usual enemies of the state intend to colonize them; but it is extremely improper to foster these distant colonies at the expense of the mother-country, as is done in respect to the British colonies. When an old settled country is improved to the highest, then, and then only, can it be necessary to provide outlets for the employment of the surplus capital of its subjects, by conquering, or purchasing some poor country, with a view to its improvement.

As to internal colonies, the encouragement of foreigners, and especially the importation of foreign slaves, must, in general, be regarded as errors in politics. The procuring of a flock of labourers in the first stage of breaking up a new and uninhabited colony, the introduction of new manufactures, or of new commercial relations, can alone justify such measures. And surely it is far better to endeavour to attain these ends by other means. The removal of idle and disorderly persons from great cities, the finding out intelligent travellers into other countries, the encouragement of experimental philosophers and chemists, together with the apprenticing of clever youths to merchants in foreign countries, would probably be equally efficacious. See Smith's Wealth of Nations, B. iv. chap. 7. Robertson's Hist. of America, vol. iii. Brougham's Inquiry into the Colonial Policy of the European Powers, 1803, vol. i. and ii. passim. Paley's Principles of Moral and Political Philosophy, vol. i. p. 381. Edwards's Welh Indies, vol. ii.

Colony of Bees. See Hive.

Colony, or Colône, a town of HindooLAN, in the cercir of Guntoor, which possesse a diamond mine on the southern bank of the Kilinah, and not far from Condavar.

Colopena Regio, in Ancient Geography, a country of Asia in Cappadocia; Seballeas and Seballe are towns of this country.

Colophon, a town of Asia Minor now Attaleia, or according to others, Belvixdr. It was one of the chief cities of the Indian league, fated near the Ica, and not, as Piny calls it, an inland city, in the small river Haleus, N. W. of Ephesus and S. S. E. of Smyrna. It was founded by Moplius, grandifico of Tircias, and, in process of time, Damacliten and Promether, sons of Codrus, conducted a colony hither. It was deforced by Lyimachus, and its inhabitants were sent to people Ephesus; but after his death it was rebuilt in a more convenient situation. The Colophonians were such excellent horsemen, that those, for whom they declared themselves, were sure of victory; whence the trite proverb "The colophonion addere, i.e. to put the last hand to a work, or successfully to terminate it." Colophon was the birth-place of Nicedor, and one of the seven cities that claimed Homer, who lived there some time, as Herodotus informs us. The ancients mention a famous grove and temple of Apollo Darius in the neighbourhood.
behood of this city; whence some have said that he derived this appellation, though others say that he was so called from a mountain bearing that name. The small town of "Notium," on the same coast, often mentioned by Livy, belonged to the Colophonians, and the Romans allowed it the same privileges, which they granted to Colophon itself. Piny informs us, that they collected in the vicinity of Colophon, a resin of a yelowish red colour, which being bruited, emitted a throng odour; and hence some have derived the name of Cyccoliun, now frequently called "Spanish wax," or "Grecian resin," as it is brought from one or the other of those countries. Its episcopal see was subject to the metropolis of Ephesus.

Colophon, a town of Greece in Epirus.

Colophon, in Botany, Commenrs. See Bursa paniulata.

COLORS, in Geography, the name given by Dion to a river of Pannonia, called Colupa, by Strabo.

COLORQUINTIDA, in the Materia Medica. See Colorcynthia.

COLOR, in the Ancient Muses. See Colours.

Color rubra; see Indigo Color.

Color aurea; see Indigo Color.

COLORADO, in Geography, a river of New Mexico, in the south-western part, which flows into the northern part of the Vermillion sea, or gulf of California, called by D'Anville colorado de los maitres. The course of this river, which is generally from N. E. to S. W. sometimes W. may be computed at 650 British miles. It is called Rio Colorado, or Red river, because the waters acquire that colour from the red clay on which the rains fall. Its stream is deep and copious, and capable of considerable navigation. The neighbouring savages, who swim adrift by a peculiar artifice, are denominated zonmaratopithec, which fe. This river is joined from the east by a large river, called Gila, which, however, is everywhere fordable. The country between these rivers is said to be an upland desert, without water or pasture. On the other side of the Colorado, the country is said to be very fertile, and the natives rather fond of cultivation. It is thought that considerable rivers also join the Colorado from the west, flowing from the same chain of mountains that supply the sources of the Rio Bravo, in lat. 49°. Among these, the Zuniga, or New Mexico, is the most lengthened stream, and may therefore be regarded as the Colorado itself. On the west of the Colorado, the river of Mitytas, and that of Pyramids, have embaracling terminations, perhaps in the same lakes, or, perhaps in the Colorado. In lat. 39° W. long. from Madrid, 110° 31', there is a large lake without a name, which receives two considerable rivers from the east, one of which is called Lencara. From lat. 42° to 43°, and under the same meridian, extends another lake, which, though not fully explored, is said to be that of Impariciones, where the fathers Velas and Ictalinestimate their discoveries, and the amount island knowledge of the Spaniards. If, indeed, the Spaniards have explored that part of the country, they conceal their informant.

On the west of the same chain, from which springs the Río Bravo, are two rivers, which probably join the Balantun: and it appears that the eastern river of Colorado has been confounded with another river of the same name, with the epithet of Nichteus, which probably joins the Atlanza or Alahabas. See Colorado or River Ranco, fra.

Colorado, a river of New Mexico, which runs into the Bay of St. Bernard, in the gulf of Mexico.

Colorado, Riviere Rouge, or Red River, a river of North America, in Louisiana, which runs into the gulf of Mexico, or rather joins the Mississippi river, before it falls into this gulf, some miles above New Orleans.

COLORADOS, Los, a numerous cluster of small islands or rocks, near the N. W. coast of the island of Cuba.

COLORATURA, in the Italian Music, is used to denote all sorts of variations, trillos, diminutions, &c. that can render a song agreeable.

COLORBASANS. See Colorbassians.

COLOREDO, in Geography, a town belonging to the state of Venice, in the country of Friuli; seven miles N. W. of Udina.

COLORETTI, Matteo, in Biography, was born at Reggio, in the year 1611, and is spoken of by Tirabolchi and the abbe Lanzi, as a most excellent painter of portraits.

COLORIFIC earth, in Mineralogy, a rush or tube of earth, in the arrangement of Kirwan, described by him as strongly staining the fingers. Of these he enumerates four families, viz. red, yellow, black, and green; the red the redder, or rubricae Rubris. Rothol. L. o. 973. Of dark cochineal red colour, or intermediate between brick and blood red, having neither luster nor transparency; fracture, earthy, sometimes conchoidal; fragments, 1/2 hard, 4/5 gr. incon siderable; adhering pretty strongly to the tongue; feeling rough; assuring a polish from the nail; strongly staining the fingers; falling immediately into powder in water, and not becoming dextrileae; not effervescing, nor easily dissolving in acids. When heated to reduce, cracking and growing black; at 155° the specimen (Lefke, o. 975) melted into a dark greenish yellow frothy enamel. It differs from red ochres only by containing more argil. The red colour proceeds from oxygenation, and the absence of acid. The mere air of water is expelled by heat, the browzer it grows. The yellow, Gellebarde, Lefke, o. 1029, is of an ochre yellow colour; as to luster, externally it often hath some globs, but internally none; transparency, 0; fracture earthy, often inclining to the conchoidal; fragments, 0; hardness, 3/5 gr. incon siderable; adhering strongly to the tongue; feels smooth, or somewhat gritty; takes a high polish from the nail; strongly stains the fingers; in water it immediately falls to pieces with some hissing; and afterwards to powder, without diffusing itself through it; does not effervesc with acids, nor is easily soluble in them; heated to reduce, it cracks, hardens, and acquires a red colour, and given a red earthy ash. At 155°, Mr. Kirwan melted the specimen, Lefke, o. (1029) into a liver brown porous porcelain mass. This yellow earth differs from ochres only in containing a greater proportion of argil; the yellow colour proceeds from the calc of iron, highly oxygenated, and probably containing both water and sand. Those earths which contain a large proportion of iron, have rather an orange colour. According to the analysis of M. S腳 of Paris, who has the merit of referring to his countrymen the immense doses acquired by the Dutch on converting this yellow earth into what is there called "English red," it contains 50 per cent argil, 45 per cent of iron. 5° water, acidulated by vitriolic acid. Mem. Par. 177, 318. The 3d family, or black, black chalk. Schwaz--Krack, Z. en, Schiffer, Lefke, o. 972. Pierre noire du Brisson, p. 15 is of a greyish black colour; luster, 0; transparency, 0; fracture imperfectly curved flat; fragments, 1 partly fe. partly long foliary; hardness, 3; 10 gr. 2114. by Kirwan's trial by Brinson, 2185 before absorption of, 2.77 after absorption of water; adheres slightly to the tongue, feels smooth, affords a polish from a knife, gives a black streak, and marks black in wa-

COLORADO.
ter does not readily moulder, but if taken out cracks in a short time; does not effervesce with acids, nor easily dissolve in them; heated to redness, it cracks and becomes reddish grey; and contains somewhat vitriolic. The 4th family, green, Lefke, o. 013, is of a greyish green colour; found generally in lumps in the cavities of other rocks, or externally invading them; lube, o; transparency, o; fracture, earthy, sometimes uneven, sometimes verging to the conchoidal; fragments, 2; hardness, from 6 to 7; fp. gr. 20,017. Sometimes feels smooth, does not assume a polish from the knife, nor adhere to the tongue, nor stain the fingers, nor mark while dry, and when wet but lightly, in water it often crumbles after floating about half an hour; does not effervesce with acids, nor is easily soluble in water; heated to redness, it cracks and becomes of a dark red earthy colour; at 147°, the specimen (Lefke, o. 013) melted into a black compact glass, resembling that of basalt; which shows it to consist of felsic, argill, iron not much oxygened, and oxyz of nickel, from which the green colour is derived, besides water. Kirwan’s Elem. of Mineralogy, vol. i.

COLORINA, or Colarina, in Ancient Geography, a town of Arabia Felix. Ptolemy.

COLORATION, or Coloration, in Pharmacy, a term applied to the several changes of colour which bodies undergo in the various operations of nature, or art; as by fermentations, lotions, cocations, oxidations, &c.

COLORITES, in Ecclesiastical History, a congregation of Angullin monks, instituted about 1530, and so called from Colorita, a mountain near Marzento, in Calabria, where a church was erected to the Virgin Mary.

COLORNO, in Geography, a town of Italy, in the Parmesan; 7 miles N. of Parmo.

COLOR, a town of Transylvania; 4 miles N. of Colofte.

COLOR Salt Mine, in Hungary; the stratum of rock salt in this famous mine, is of the enormous thickness of 60 fathoms; the diameter of the excavation made therein by the miners, is 50 fathoms. “Born’s Hungary,” p. 140, 143.

COLOS, See Colos.

COLOSSAL COLUMN. See Column.

COLOSSI, in Ancient Geography, now Chonos, or Konos, a city of Phrygia Major, in that part called Paeanien, seated on an eminence, on the south side of the Meander. It was built by the river Lyces, near the place where, according to Herodotus (I. vii. 620), it begins to run under ground, as it does for five furlongs before it rises again, and flows into the Meander. This city was situated at an equal distance between Laodicea and Hierapolis; and to this place thebes came in his expedition against Greece. All thee three cities perished by an earthquake, says Eusebius, in the 10th year of Nero, or about two years after St. Paul’s epistle was sent to the Christians at Colosse. The government of this city was democratic, and its first magistrate bore the title of archon and prexer. This city, having been forcibly transferred to the Ptolemies by the Macedonians, paled afterwards to the Salamis. After the defeat of Antiochus III. at the battle of Magnesia, it became subject to Eumenes, king of Pergamos. And when Attalus, the last of his successors, bequeathed his dominions to the Romans, this city, with the whole of Phrygia, formed a part of the praefectural province of Asia, which division subsisted till the time of Constantine. After the reign of this prince, Phrygia was divided into Phrygia Paeanien, and Salutaris, and Colosse was the fifth city of the first division. It afterwards took the name of Chonos, or Konos.

COLOSSIANS, Epistle to the, in Biblical History, a canonical epistle, addressed to the Christians at Coloss by the apostle Paul, and conveyed to them by Tychicus and Onesimus, towards the close of St. Paul’s first imprisonment at Rome, which was about the year of our Lord 63, or the 9th of the emperor Nero. As Timothy joins with the apostle in the salutation at the beginning of this epistle, he was still at Rome, and not yet sent away to Philippi; and here Dr. Lardner concludes, that this epistle was written about the same time with that to the Philippians, in the year 62, and some time before the end of it. Although it appears from this epistle, that a Christian church was established at Colosse; we have no account by whom, or at what time, it was founded. Some have concluded from chap. ii. 1, that St. Paul had never been there himself. It is not, however, improbable, though no mention occurs of this fact in the history of the Acts, that the Colossians might have been converted while Paul resided at Ephesus, considering more especially that he spent no less than three years in that city, and preached with so much success, that St. Luke tells us, (Acts, xix. 20.) that “all they who dwelt in Afa heard the word of the Lord, both Jews and Greeks.” (See Acts, ch. vi. xvi. 23.) Dr. Lardner, arguing from the testimony of Theodoret (tom. iii. p. 342, 343.), who lived in the 5th century, alleges a variety of considerations, inducing him to think, that the churches of Colosse and Laodicea, had been planted by St. Paul, and that the Christians there were his converts. Of these he shall only mention the three following, viz.: that the apostle was twice in Phrygia, in which were Colosse, Laodicea, and Hierapolis (Acts, xvi. 6); that he does not, in effect, or even expressly say, that he had dispersed the gospel to the Colossians (Epist. ch. ii. 14—15); and that from several passages which occur in this epistle, it appears, that the apostle is not writing to strangers, but to acquainted, disciples, and converts.

The Christians of the church at Colosse seem, from the honourable testimony that is born to them in this epistle, to have maintained an honourable character for their party, and the zeal they discovered for the gospel; nevertheless, we find, from the cautious addressed to them in the second chapter, that they were in some danger of being drawn aside by the futilities of the Heathen philosophers, and the inducements of certain Jewish zealots, who insinuated upon the necessity of conforming to the ceremonies of the Mosaic law. Accordingly, the grand design of this epistle is to exalt the Colossians, by the most persuasive arguments, to a temper and behaviour worthy of their sacred character, and to secure them from the influence of those Pagan sophists, or Jewish bigots, who would seduce them from the purity of the Christian faith.

COLOSSUS, a statue of enormous or gigantic size. The most eminent of this kind was the colossus of Rhodes, one of the wonders of the world, a brzoan statue of Apollo, so high, that ships sailed with full sails below its legs. It was the workmanship of Chares, a disciple of Lydippus; who spent twelve years in making it: it was at length overthrown by an earthquake, B. C. 224, after having stood about sixty-six years. Its height was a hundred and five feet; there were few people who could encompass its thumb, which was said to have been a fathom in circumference, and its fingers were larger than most statues. It was hollow, and in its cavities were large stones employed by the artificer to counterbalance its weight, and render it steady on its pedestal.

On occasion of the damage which the city of Rhodes sustained by the above-mentioned earthquake, the inhabit-
ants sent ambassadors to all the princes and states of Greek origin, in order to solicit his assistance in repairing it; and they obtained large sums, particularly from the kings of Egypt, Macedon, Syria, Pontus, and Bithynia, which amounted to a sum five times exceeding the damages which they had suffered. But instead of setting up the colossus again, for which purpose the greatest part of it was given, they pretended that the oracle of Delphi had forbidden it, and converted the money to other uses. Accordingly the colossus lay neglected on the ground for the space of 834 years, at the expiration of which period, or about the year of our Lord 653, or 672, Mosæus, the 6th caliph, or emperor of the Saracens, made himself master of Rhodes, and afterwards sold their statue, reduced to fragments, to a Jewish merchant, who loaded 900 camels with the metal; so that, allowing 500 pounds weight for each load, the brass of the colossus, after the diminution which it had sustained by rust, and probably by theft, amounted to 720 thousand pounds weight.

Some critics observe, that the colossus of Rhodes gave its own name to the people among whom it stood; and that many, at least among the ancient poets, call the Rhodians Colossians: hence they advance an opinion, that the Colossus in scripture, to whom St. Paul directs his epistle, are, in reality, the inhabitants of Rhodes. Of this sentiment are Suidas, Caepine, Munzer, &c.

The basis that supported it was of a triangular figure: its extremities were furnished by sixty pillars of marble. There was a winding stair-case to go up to the top of it; from whence one might discern Syria, and the ships that went to Egypt, in a great looking-glass that was hung about the neck of the statue. This enormous statue was not the only one that attracted attention in the city of Rhodes. Pline (I. xxxiv. c. 37.) reckons 100 other colossi not so large, which rose majestically in its different quarters. Besides these, there were to be seen five others, the work of Briesis, and representing divinities. Among the antiquities of Rome, there were seven famous colossi: two of Jupiter, as many of Apollo, one of Nero, one of Domitian, and one of the Sun.

COLOSTRUM, or COLOSTRA, in Medicine, the first milk of any animal after bringing forth young, called in common bovdings. It is remarkable that this milk is generally cathartic, and purges off the meconium; thus serving both as an aliment and medicine.

The same name is likewise given to a diseased which this thick coagulated milk sometimes occasions.

An emulsion prepared with turpentine, dissolved with the yolk of an egg, is sometimes also called by that name.

COLOSVAR or CLAUSENBOURG, in Geography, the Zungua of the ancients, by the Hungarians called Kolosvaar, and in Latin Claudiepolis, a town of Transylvania, seated on the first branch of the river Samos, and surrounded by an ancient thick wall, where the states of the province usually assembled. The university was suppressed in the year 1782. The Unitarians, who formed one of the sects received in Transylvania, established their principal seat in this place: 255 miles E.S.E. from Vienna, and 45 N.N.E. from Belgrade. N. lat. 48° 37' E. long. 22° 21'.

COLOT, GERMAN, in Biography, a famous lithomith of the 15th century, practised surgery at Paris, during the reign of Lewis IX., from the year 1261 to 1283, and was in great favour with that prince. He was the first regular bred surgeon who practised lithotomy. The operation before his time had been engrossed by persons practising no other part of surgery. Regular practitioners had probably been deterred from interfering in the business, from reverence to the authority of Hippocrates, who obliged his disciples to swear they would not perform the operation. "Nec vero calculo laborantes fecabo," He ingratiated himself with some of the itinerant practitioners, law them perform the operation, and began with cutting dead bodies. Having communicated his ideas to the physicians of the court, they obtained leave from Lewis, that he might operate on a condemned criminal, who was attacked with the stone in the bladder. The criminal confuted, on the condition promised, that he should be pardoned the crime he had committed. The operation was successfully performed, the patient recovering, it is said, in fifteen days. Colot obtained great reputation by the cure, which was rewarded by a pension from his sovereign. The time of his death is not known.

COLOT, LAURENCE, a defendant of Germain, from whom he acquired the art of cutting for the stone, was in great reputation, in the early part, and to the middle of the 16th century, for his skill in performing the operation, by what is called the greater apparatus. By this method the urethra and neck of the bladder are necessarily cut through, which subjected the patients, not unfrequently, to fistula, and other inconveniences, yet by his dexterity in operating these accidents were often avoided, which gave him so much credit, that he was sent for to visit patients in Flanders, and other distant countries. To retain him in France, Henry II. made him his surgeon in ordinary in the year 1550, rewarding him with a pension, adequate to the loss he sustained, by being prevented visiting patients in foreign countries. He also crested for him the poll of lithomith to the royal family, which was continued to three of his descendants. Philip, the last of them, died in 1616, aged sixty-three years.

COLOR, FRANCIS, son of Philip, appears to have inherited, with the name, the skill and dexterity of his ancestors, in performing the operation of lithotomy. He left a treatise on the operation, which was published in 1727, under the title of "Traité de l'opération de la taille, avec des observations sur la Formation de la Pierre, et les Suppressions d'Urines," 12mo. Paris. In this work he gives a short history of the method of operating by the greater apparatus. It was invented, he says, by John de Romanis, a physician of Cremona, Italy, in 1525, and by him communicated to Marianus Sanetius, who instructed Octavian de Via, a surgeon at Rome. Marianus published, in 1535, "Libellus Aureus, de lapide et Vesica per incisionem extra hendo," Svo. Venet. Of Octavian de Ville, who was several times called to France, to perform the operation, Laurence Colot is supposed to have obtained some valuable information on the subject, which contributed much to the celebrity he afterwards enjoyed. The method of operating by the greater apparatus has been long since abandoned for a more simple and easy operation, therefore called, by the latter apparatus, first discovered, Mr. Sharp says, by Mr. Foubert, an ingenious French surgeon, but much improved by Mr. Chefield, in which the urethra and neck of the bladder are avoided by the operator; with Francis Colot, the celebrity of the family, seems to have been extinguished.

Eloy Dict. Hill.

COLOUR, or COLOR, from the Latin, color, in Philosophy, means that property of bodies which affects the sight only; thus the grass in the fields has a green colour, blood has a red colour, the sky generally appears of a blue colour, and fo forth; nor can those colours be distinguished by any of our other senses, besides the sight. The variety of colours, as they are presented to us by the substances that
surround us, is immense, and from them arises the admirable beauty of the works of nature in the animal, in the vegetable, and in the mineral kingdom, or, more properly speaking, in the universe. The science, which examines and explains the various properties of the colours of light and of natural bodies, and which forms a principal branch of optics, has been properly denominated _chromatics_, from the Greek word, _χρώμα_, which signifies _colour_. We shall, however, rate this theory in the present article, as being much more obviously recurred to by those persons who wish to be informed on the subject. A distinct idea of what is meant by the word _light_, may be easily formed by its contrast with _darkness_, which is a privation of light. With our eyes shut, we have _darkness_; if we open our eyes, whatever we perceive through them is occasioned by the agency of light, and the various colours of bodies are parts of that light.—It has sometimes been pretended by certain ignorant persons, that they could distinguish colours by the touch; but the testimony of divers intelligent persons, who have had the misfortune of being blind, in consequence of which their touch has, from necessity, become very exquisite, has constantly contradicted those vain affections. Besides, it will appear from the following theory of colours, that to differentiate colours by the touch is utterly impracticable. There are indeed certain pigments of common use in painting, which, either from their roughness, smoothness, unctuosity, or other quality, may affect the touch, and with a little practice a person may learn to distinguish the feel of vermilion which looks red from that of lamp-green, which looks green, and so forth; but this is not the art of distinguishing colours by the touch. It is only the art of distinguishing certain peculiarities of surface. In fact, if two pigments exactly of the same texture (and several such there are) but of different colour, be presented to the fingers of a man with his eyes shut, he will pronounce them to be exactly of the same colour. The questions which naturally occur to the human mind in the contemplation of colours, are, whence do they derive their origin?—Are they produced by the coloured bodies themselves, or by something external?—Do they move from the coloured bodies to our eyes, and strike upon them, or enter them; or are they owing to some medium interposed between the various bodies of the universe?—Are they material or not?

The ideas entertained by the ancients concerning the nature of colours, were mostly wild and absurd; nor has the present theory, imperfect as it is, been formed without an innumerable variety of experiments, observations, and the convicing investigations of a great many ingenious persons. The followers of Pythagoras called colour the superficies of bodies; Plato considered it as a flame issuing from them; Zeno called it the first configuration of matter; and Aristotle said it was that which rendered bodies actually transparent. We need not add a formal refutation of those extravagant ideas, which were the mere off-spring of the imagination, unsupported by experience and by reason. The philosophers of those times paid little or no regard to experiments; hence they made no discoveries or improvements worthy of being recorded. A long and unprofitable period of nearly 2000 years elapsed, from the commencement of philosophical study in Greece, until about the time of Descartes, when the revival of learning in Europe renewed with additional vigour the enquiries concerning the nature of light and colours. And it is curious to observe by what small steps, and what circuitous ways, any useful discoveries were made. See Priestley's history of vision, light, and colours. Descartes considered colour as a modification of light, and he attributed the difference of colour to the prevalence of the direct or rotary direction of light. Grimaldi, Dechales, and others, supposed that a certain elastic medium of a peculiar kind filled the universe, and that the differences of colour depended upon the quick or slow vibrations of this medium. Rohault imagined that the different colours were produced by the rays of light entering the eye at different angles with respect to the optic axis. And Dr. Hook imagined that colour is caused by the vibration of the oblique or uneven pulse of light; which being capable of no more than two varieties, he concluded there could be no more than two primary colours. Such were the ideas of philosophers respecting the nature of colours, when Sir Isaac Newton began to examine the subject in his cautious experimental manner, by which means, about the year 1666, he discovered the foundation of a theory of colours, which has been fully adopted and admired by his contemporaries, as well as by the present succeeding generation. Rays of light issuing from a luminous object, proceed in straight lines as long as they pass through a uniform medium. If they meet with a transparent medium of different density, they will also proceed through it in straight lines, provided they enter that medium in a direction perpendicular to its surface, otherwise they are caused to bend their course, so that beyond the aforesaid mentioned surface they proceed in straight lines also; but these straight lines form a certain angle with the straight lines of their direction before they entered the last medium. The bending of the rays is called the _refraction_ of light, and the angle that has been just mentioned is called the angle of refraction. See _Refraction_. Newton, having presented a glass prism, or kind of wedge, to the light of the sun, which ented a dark room through a small hole, found not only that the rays were bent from their course, viz. refracted, but he likewise observed that the image of the sun was thereby considerably elongated; and this elongation of appearing of a uniform bright white light, was resolved into a series of colours, which exactly resembled the colours of the rainbow. This elongation of the solar image thus formed, is called the dispersion of light. These colours pass from one to the other by very small, and altogether imperceptible gradations; so that it is impossible to say where one begins and the next ends. Various methods have been tried for the purpose of rendering the colours of this prismatic spectrum more limited and distinct; none, however, has been attended with complete effect. The following seems to be the best method. Let the light of the sun pass through a hole of about one-tenth of an inch in diameter, into a dark room. Place a screen at a little distance from the hole (for instance six or seven inches) within the room; and let the middlemost part of the light pass through a similar hole in the screen; the object of which is to prevent, in great measure, the scattered light or penumbra, on the sides of the spectrum. Let the light then fall perpendicularly upon a convex lens; at the distance of about 10 feet, by which means a defined image of the sun will be formed upon a screen placed at the focal distance of the lens. Now, if a prism be placed close to the lens, so that the light, after having passed through the lens, may pass through, and be refracted by, the prism; then a coloured spectrum will be formed upon the screen. The long sides of this spectrum are very well defined; but its narrow terminations are semicircular, and its whole length consists of circular coloured images of the sun intermixed with each other, especially about the middle or axis of the spectrum; yet the most prominent colours are more distinguishable from each other, especially towards the sides of the spectrum, so that their boundaries may be marked with tolerable accuracy. The glass prism fit for this experiment must be well formed,
and free from veins, scratches, bubbles, &c. Those principal colours are seven in number, viz. red, orange, yellow, green, blue, indigo, and violet. They do not occupy equal spaces in the spectrum; but for the proportion of their breadths, and likewise for a more accurate description of the prismatic experiments on light, see the article REFRACTION.

The above described experiment with the glass prism gave Mr. Isaac Newton reason to conclude that the white light of the sun consisted of seven colours, which had different powers of being refracted, so that the red rays were refracted least, the orange a little more, the yellow still more, and so on; hence the image of the sun was converted into an oblong variegated spectrum. In confirmation of this theory Newton instituted a variety of other experiments, which were attended with remarkable results, and the principal of them are as follows:

If the light which has been refracted and dispersed by a prism, be received again upon another prism which must be situated in a direction perpendicular to that of the former: the spectrum will by that means be removed from its original situation into a lateral one; but its breadth and its colours will remain unaltered. Now if the elongation of the beam of white solar light, and its resolution into different colours, were a modification of light produced by the prism only; then the second prism ought to expand the spectrum in breadth, so as to form a quadrilateral figure of equal sides; but instead of that we find that the colours and their breadth remain unaltered.

If the refracted and dispersed beam of solar light, be received upon a concave reflector, the different coloured rays will be reflected to a focus, where they will form a white or colourless image of the sun. But if any of the colours be stopped by the interposition of a wire, or other slender and opaque body between the prism and the reflector, then the image will become coloured with some mixture of colours. This proves that white light consists of coloured rays, intermixed in a certain proportion, and that by a mixture of the rays of the seven primary colours in that due proportion, white light is produced. Therefore, white arises from a certain mixture of colours, and blackness arises from a stoppage or absorption of all colours. This property of light and colours, may be familiarly illustrated by the following experiment: Divide the flat surface of a wheel, or the upper flat surface of a top, such as boys use, by means of links going from the centre to the circumference, into seven parts, having the same proportion that the breadths of the colours have in the prismatic spectrum, and let those portions be painted respectively with the seven colours. This done, if you spin the wheel or the top, so as to cause it to turn very fast, in the light of the sun; you will find that the painted surface will look white; for by the quick motion of the wheel, the impression of the colours in the eye become mixed, and of course they form a white light. Stop the wheel and the seven colours will appear very distinct.

If, when a spectrum is formed by the light which has passed through a prism upon a screen, a small hole be made through the screen, and the rays of one colour only be permitted to pass through it on the other side of the screen; then whatever is viewed in that homogeneous light, will appear of that particular colour. Thus, if the red light only has passed through the hole, then blood, or grass, or milk, &c. viewed in that light behind the screen, will all appear red; excepting that the blood will appear of a brownish red colour, or the grass or the milk. If the blue light only has been transmitted through the hole; then the above-mentioned substances will all appear blue; and the like may be understood of the other homogeneous colours. This proves that the colours, which seem to proceed from coloured bodies in general, do not belong to those bodies, but are the component parts of the white light, in which those bodies are viewed, and that certain bodies have the property of absorbing some of those coloured rays of the white light which falls upon them, and of reflecting others. Thus, grass reflects the green rays and absorbs the red, hence, the green rays coming to our eyes, render the appearance of grass green; thus blue absorbs every other coloured ray excepting the red, and so forth. Black bodies absorb all the seven coloured rays, and white bodies reflect them all.

If two holes, at about a foot distance from each other, be made in the shutters of a dark room, and two prisms be used, viz. a prism be placed to receive the light at each hole, two spectrums will thereby be formed upon the screen; and by turning the prisms gently round their axes, the spectrums may be caused to fall one upon the other. Let the yellow of one spectrum fall upon the blue of the other, and at that place the mixture of those two colours will appear green. Let a small hole be made exactly at that place, and that green light will pass through the hole behind the screen, and will form a green circular image upon another screen placed to receive it. Now, if exactly behind the perforation of the first screen, you fix the refracting angle of a prism, then the image upon the second screen will not only be moved from its place, but will appear oblong, with a yellow border at one extremity, and a blue border at the other extremity; for that spot or image of the sun consists of two primitive colours of different refrangibilities. The same thing must be understood of any other colour formed from a mixture of any two primitive prismatic tines; for any two of those colours will form, or rather will look like an intermediate colour; thus, red and yellow form an orange, blue and violet form an indigo, and so forth.

If the experiment be performed with one solar spectrum: viz. a single prismatic colour; for instance the green be permitted to pass through a hole in the screen, and be then received upon another screen, the image will be of the same colour as in the preceding experiment, viz. green, and circular. Now, by placing a prism behind the perforation of the first screen, the green image will be moved from its place, but it will not be elongated nor altered in colour, because this image consists of one uniform primitive colour. (Newton’s Opt. b. i. p. ii. prop. iv.) This remarkable experiment shows, that though a green may be formed from a combination, or any other prismatic colour may be formed from a combination of the two adjacent colours; yet each of these colours in the prismatic spectrum, is a primitive uniform or homogeneous colour.

Notwithstanding the conviction which naturally attends the result of the above mentioned experiments, several persons have supposed that the primitive colours of light are not seven, but three only; namely, red, yellow, and blue; and they have been led to this supposition, by observing that the painters can produce all the other colours, by mixing either all those three colours together, or two of them, in due proportion.

A recent writer of eminence in the philosophical world, (M. C. A. Priestly) has started another theory. He thinks that the primitive colours. (viz. the components of white light) are three in number; but he supposes them to be the red, the green, and the violet; and that the other colours of the spectrum are formed from a mixture of three; that is the yellow from the red and the green, the blue from...
from the green and the violet, &c. See l'Annales de
Clinic, Sept. 1826.

Hitherto we have treated of the formation of colours by
refraction; from which it appears that the white solar light
consists of coloured rays; but whenever that light enters a
transparent medium in an oblique direction, it is caused to
deviate from its rectilinear course; and at the same time its
component coloured rays, are separated in consequence of
their different refrangibility. The next series of facts, upon
which the theory of colours depends, relates to the infusion
of light, it having been found, that the rays of light are
bent in their course, and resolved into their component
colours, not only by refraction, but likewise by merely
palpable by the surfaces of bodies. It seems that the rays of
light are attracted by bodies, when they come within a cer-
tain distance of their surfaces, and that the coloured rays of
white light being attracted more or less, are separated from
each other. A great variety of experiments relating to this
infection of light, were originally made by Newton, and
have, since his time, been instituted by other able philoso-
phers. But, though several remarkable facts have been
discovered; yet the prevalent state of knowledge does not
admit of their being reducible to a single principle, or to
any general and comprehensive laws.

In order to give our readers some idea of this property
of light, we shall now fulfil an experiment related by a
recent anonymous writer; referring then, to the reader to the
article Inflection of Light, for a full account of whatever
belongs to it.

"Across a beam," says the above-mentioned author, "of
folar light, admitted into a dark chamber, through a small
hole in a thin piece of lead, nearly \( \frac{1}{5} \) of an inch wide, I
interposed a hair of a man's head, and receiving the beam
on a screen, or sheet of white paper at a distance, and with
an obliquity convenient for the purpose, I noted the follow-
ing appearances.—At the termination of what may be con-
considered as, and therefore may be called, a shadow, whose
intensity or darkness was not considerable; the following
orders and distincions of colours appeared. First, and
nearest to the dark or black parts of the shadow, might be
seen a dilute blue, changing into a breadth of white light,
followed by breadths of yellow and red. To these succeed-
ed an interval of dilute thade, then breadths of dilute
violet, blue, dilute green, yellow, red; then green dilute
yellow, red; dilute green, red; white, dilute red; and
finally white light. These are the more general orders of
the colours. Of these orders, the three first were suf-
sufficiently obvious and distinct; the last evanescent and requiring
accommodation of circumstances to produce, and attention to
perceive them." Observations concerning the Inflection
of Light, &c. London 1799.

The last of facts that remains to be mentioned, as relat-
ing to colours, consists of the phenomena exhibited by
thin transparent bodies, especially by those of variable
thickness. Every person must recollect to have seen the
bubbles of a solution of soap, or of other thickening sub-
stances, exhibit a variety of colours similar to those of the
folar spectrum, or of the rainbow. These bubbles are no-
thing more than thin veils of the solution, whose thick-
ness varies continually. But a variety of thin solid sub-
stances exhibit the like phenomenon, such as plates of muf-
covy glass, or of tale; thin plates of glass; metallic and
glass plates moistened with a variety of fluids, &c. Newton
took two object glasses of telescopes, one of which was a
plane convex, and the other a double convex one. He laid
the latter on the flat side of the other, and prefixed them
gently. Instantly circles of colours appeared about the
point of contact, which increased and decreased both in
number and in size, according as the lenses were more or less
forcibly pressed against each other. The central spot was
black, and circles of colours appeared round this spot, which
were brighter near it than farther off. Their order, com-
mencing from the black spot, was blue, white, yellow, red;
violet, blue, green, yellow, red; purple, blue, green, yellow,
red; green, red; greenish, blue, red; greenish, blue, pale
red; greenish, blue, reddish, white. (Newton's Optics, b. ii.
p. 1. Ob. sc. iv.) Experiments similar to the above have
also been performed with flat glasses, leaves of various cur-
vatures, and other substances, by other philosophers, such as
Moraldi, Grimaldi, Delisle, Mairan, Mazzoni, Du Tour,
seet. 6. After the above succint account of the principal
experiments that have been instituted, and the various im-
portant discoveries that have been made, concerning
the nature of light and colours; it is proper to observe, that
the subject is not only very far from being exhausted; but
that the theory arising from those experiments and discoveries
is doubtful in almost all its parts. The number of primitive
colours distinct from one another, if such do really exist,
is not quite determinate; the attraction between the rays
of light and other bodies is an hypothesis not clearly un-
derstood; for it is a prevailing opinion with several philo-
osophers, that the rays of light are attracted within a cer-
tain distance, and repelled beyond that distance. The re-
flection of coloured rays from the surfaces of bodies is likewise in-
volved in much uncertainty; it being unknown whether the
reflection takes place at the very surface, or at a little
distance beyond it by force power inherent in bodies, or,
lastly, from some other surface a little within the bodies,
by which supposition is founded upon the hypothesis that all
bodies are transparent, as far as a very small part of their
bulk, which hypothesis is founded upon the observation
that several dense and opaque bodies, when much atten-
nuated, become, in some measure, transparent; and that in
the case with gold leaf, when placed against the
light, appears of a greenish cast.

Notwithstanding this uncertainty respecting the theory in
general, the following particulars seem to be sufficiently
established; namely, that by refraction and infection the
white light of the sun is resolved into coloured light.
Here it may be naturally asked whether the light of other
luminous objects is not resolved, by the like means, into
the fame colours? The observations made in relation to
this particular are not so numerous, nor so exact as might
be wished; it appears, however, that some luminous ob-
jects yield rays of particular colours more abundantly than
of other colours. The abbé Rochon having placed a
prisma before an achromatic telescope, observed through it
the light of the stars; and found that the white light of
Sirius was resolved into an oblong spectrum, which con-
stituted almost entirely of three colours, viz. red, green, and
violet. An indication of yellow was barely discernible
between the two first, and a slight degradation between the
two last. Through Dr. Herchells' powerful telescopes
most of the fixed stars seem tinged with peculiar colours,
viz. some evidently incline to a green, others to a red, and
so forth. The light yielded by particular combinateles is
also tinged with peculiar colours, and the furnace of wine is
a strong instance of this nature; for it common
fact be mixed with the spirit, the light of its flame seems to
be entirely deluxite of red, yellow, and violet, and it is
owing to this peculiarity that children frequently play with
it in order to give a ghastly appearance to the surrounding

P 2 com-
company. When baryc (ponderous earth) is mixed with spirit of wine, its flame is yellow; boracic acid renders it green, and drontian earth gives it a purple colour.

The phenomena of coloured bodies, as they occur to us, in general, may be distinguished into five classes, viz. 1. The colours that arise from evident refraction, such as the colours of the rainbow, of the bubbles of a solution of soap, &c. 2. Tholse of opaque bodies that are fixed. 3. Tholse of opaque bodies that are not fixed. 4. Tholse of transparent bodies formed by the light falling through them. 5. Tholse that are changeable, according to the situation of the eye, like the colours of certain fluids, feathers, flowers, thin lamiae. &c. and the light falling through them.

With respect to this, it must be observed, that a transparent body, like a plate of glass, a drop of water, or the reflection of its surfaces at the same time that it lets part of the light pass quite through its substance. Direct your eyes to the surface of a common glass plate, and see the reflection of an object, as in a looking glass, and if you observe attentively you will perceive two reflected images close to each other, viz. one from the anterior, and the other from the posterior surface. In moist looking glasses, if you place a lighted candle on one side, and view the reflected image of it from the other side, you will generally see a succession of images of the candle fainter and fainter, in proportion as they recede from the principal image. The reason of this appearance is, that since both surfaces reflect, the image formed by the reflection of the posterior surface is partly transmitted to the eye of the spectator, and partly reflected from the anterior surface to the posterior one, the latter of which is again reflected, and so on. Now, in the case of the drops of rain, when they form the rainbow, the light of the sun falling obliquely on the surface of the drop is refracted and resolved into colours, in which state it proceeds through the drop to its farther surface, from which it is partly reflected to the eyes of the spectator. The same explanation is evidently applicable to the colours of the bubbles of soap, thin transparent lamiae, and the like. See RAINBOW.

2. The fixed colours of opaque bodies are in all probability owing to their absorbing some of the coloured parts of white light and reflecting others; their immense variety arising from a mixture of the reflected primitive colours in various number and proportion; but it is impossible to say at present whether that reflection is effected at the very surface, or at some distance from it, either within or without the body; also to what cause the disposition of reflecting certain colours in preference to others may depend upon. Mr. Delaval's experiments seem to indicate that the colour of opaque bodies arises from the light that has passed through a thin layer of transparent coloured particles, and is then reflected by the smooth surface immediately under them.

3. The greatest number of accurate experiments, concerning the colours of transparent bodies, was made by Edward H. Delaval, esq. F.R.S. (See his Paper in the Memoirs of the Lit. and Philos. Society of Manchester, vol. ii.) His experiments were performed with an immense variety of liquids differently tinged by metallic solutions, decocations, and infusions of flowers, rubins, gums, woods, mineral and animal matters. Tholse liquids he placed in phials of flat glass, of a parallelepiped form, with an oblong cylindrical neck. “I covered,” he says, “the bottom, and three of the sides of each of these phials, with a black varnish; the cylindrical neck and the anterior side, except at its edges, were left uncovered.”

In order to examine what colour those liquids would exhibit, either by transmitted or by reflected light, he viewed them through the neck of the phial, or looked into the phial through the side which had been left uncovered by the varnish. But with respect to this latter case, he says, “the uncovered side of the phial should not be placed opposite to the window, through which the light is admitted; because in that situation the light would be reflected from the farther side of the phial, and would be transmitted through the coloured liquid; and it is observable that smooth black surfaces reflect light very powerfully. Now, as it is a principal object in the experiment that no light be transmitted through the liquids, this will be accomplished by placing the uncovered side of the phial in such a direction that it may form a right angle with the window.”

All the coloured liquids, which Mr. Delaval tried in the above-mentioned manner, appeared tinged with their peculiar colours, when viewed through the necks of the phials; but when he looked on that part of the liquid which filled the body of the phial, he perceived no colour whatever, the whole appearing black; which proves an important fact, namely, that transparent coloured liquids do not yield any colour by reflection, but by transfixion only. “If these liquids,” he observes, “are spread thin on any white ground, they appear of the same colours which they had exhibited when viewed in the necks of the phials; as the light reflected from the white ground is, in this case, transmitted through the coloured medium. But when they are spread upon a black ground they afford no colour. The black ground, however, should not be a polished body; as the light reflected thereby would be transmitted through the thin medium on its surface, and be tinged by passing through it.”

Next to the above, Mr. Delaval relates various other experiments which he made with transparent solids, vis. with coloured glasses, which he made on purposes, by tinging the substance of the glasses with metallic and other matters, in imitation of real gems. These coloured glasses exhibited phenomena similar to the coloured fluids. “Having,” this author says, “formed pieces of such glasses, about two inches thick, I included all their sides with black cloth, except at their farther and anterior surface. Each of these pieces of glasses vividly exhibited its colour, when viewed by transmitted light; but when the transmitted light was intercepted, by covering the farther surface, the anterior surface afforded no colour, but appeared black. When plates of transparent coloured glasses, somewhat thicker than window glasses, are viewed by transmitted light, it is well known that they exhibit their several colours. I intercepted the light, which was transmitted through coloured plates, by fixing a piece of black cloth contiguous to their farther surface. The plate, thus prepared, when placed in such a direction that they form a right angle with the window, appear perfectly black; which shows that the coloured particles do not reflect any light.”
It is hardly necessary to observe that wherever light is transmitted through any coloured transparent body, a greater part of it is left, than when that body is quite colourless; for by transmitting one sort of coloured rays more copiously, it flours a great part of the oppositely coloured rays.

Besides these transparent coloured bodies which have been just noticed, there is a vast gradation of others between them and those that are perfectly opaque. Thefe, which are called femaillicular, or femtransparent, exhibit a vast variety of phenomena arising from the various proportion of the opaque and the transparent particles which enter in their composition. Thus some appear of the same colour, whether viewed by transmitted, or by reflected light, others exhibit one colour by transmitted and another by reflected light; others again appear of various colours, according to their thiefefts, &c. See Newton's Opt. l. i. p. ii. prop. 2.

4. The falt paragraph may, in fome measure, tend to illustrate the nature of thofe coloured ficks, feathers, &c. which change their colour according to the angle in which they are viewed, and in which the light falls upon them; other circumstances, however, are concerned in the phenomena of thofe bodies. Thus the furfaces of some of them are very irregular, in consequence of which they reflect with fome of their particles, whilst they absorb moft of the light with other particles; hence, when by a lateral view, the former or the latter are placed out of the direétion of the eye, the colour of the whole appears different from what it does in another point of view. Certain bodies of this fort may likewise be transparent to a certain small depth, in which case they become visible partly by reflected and partly by refracted (confequently decompofed white) light; hence the eye of the fpectator muft, according to its situation, fee fome coloured rays in preference to others. The phenomenon of thofe changeable bodies, meaning with refeft to colour according to situation, are far from being clearly understood; it is moft probable, however, that in them all, the three principal properties of light are concerned, namely, its reflection, refraction, and inflection.

5. In the practice of various arts, wherein colours are concerned, fuch as in dyeing, enamelling, painting in oil or water colours, &c. a change in colour of moft of the materials is commonly observed, which is evidently produced by the action of the air, the fire, the oil, or other agent to which the colouring materials are exposed, and by which they undergo different degrees of chemical alteration in their nature. This obfervation, and a defire of investigating the nature of thofe changes, with a view of improving the practical arts dependant upon them, induced ferveral perfons to try a variety of experiments, and Mr. Delaval, the fame above-menioned gentleman, who invesigated other branches of the prefent {ubject, became one of the greatest labourers in this field of inquiry. Were we acquainted with the nature of thofe particles in bodies which refeft or refraft the coloured rays, and had we a fufficient knowledge of the alterations produced in thofe particles by the action of different agents or reagents, be they oils, acids, air, alkalies, &c. a fuch idea might perhaps be formed of the changes in colour, which muft arise from certain combinations; but as the prefent state of knowledge does not admit the formation of fuch a theory, the whole must reft upon conjecture, and the practical part muft depend upon the reft of particular experiments.

Sir Isaac Newton thought, that bodies refeft and refraft light, by the fame power in different circumstances. Also, that the forces of bodies to refeft and refraft light, are very nearly proportional to the denfities of the fame bodies, excepting that unctuous and fulphureous bodies refraze more than others of the fame denfity. In support of this affection he relates feveral experiments, the refult of which he expreffes in a table, wherein the proportion of the fines which meafeure the refractions of the feveral bodies, the denfities of the bodies estimated by their specific grauity; and their refractive powers in reft of their denfities are flated in feparate columns. Mr. Delaval conceived that the defer fluidities ought, by their greater refractive powers, in like circumftances, to refecf the left refrangible rays; and that fluidities of left denfity, fhould refect rays proportionably more refrangible, and thereby appear of feveral colours in the order of their denfity. Agreeable to this fuppofition he gives infiftances of natural bodies, which differ from each other in denfity, though circumftanced alike in other refpects, excepting in their colour, which colour follows the order of their denfity; the denfity being red, the next in denfity orange, the next to that yellow, then green, &c. In support of this hypothesis Mr. Delaval made feveral experiments with glafs tinged by metallic particles, in which the colour of the glafs, in a great meafeure, corresponded to the denfity, or to the specific grauity, of the metal concerned. But this feries of experiments is not extended to that degree, nor is it conducted with that caution, which a confirmation of the hypothesis demanded. Mr. Delaval alfo intituted similar experiments with coloured liquors, in which he endeavoured to fhew, that by an incification or an attenuation of their particles, their colours may be changed in one order or in the revere. His mode of attenuating thofe liquors was accompanied, as he fuppofed, by the addition of acids, and that of incification, by the addition of alkalies. But however fecutive this hypothesis may at firft finge appear, a strict examination of facts will easily fhew the fallacy of it in almost all its parts, and feveral writers have pointed out fome of its defects, but none better than Dr. Bancroft, F.R.S. in his "Experimental Researches, concerning the Philosophy of permanent Colours," vol. i. chap. i. In this excellent work, Dr. B. fhews that Mr. Delaval has not noticed the change of nature, as well as of specific grauity, which the metals undergo by their being exposed to different degrees of heat, together with the glafs. He also observes, that if, according to Mr. Delaval's hypothesis, the deferft bodies are of a red colour, or approximating to it, platinum, the heaviest of all known metals, ought to be red; whereas it is white, like tin, and the lighteft metals. Also gold, the heaviest metal next to platinum, is much farther removed from the red colour than copper, which is much lighter. With refpect to Mr. Delaval's experiments on coloured liquors, Dr. Bancroft fays, "instead of choofing and employing mechanical means, which alone are fifted to produce thofe effects, and only thofe effects, he has recourse to mere chemical agents, whose actions in the way which he fuppofes must have been almost doubtlefs, though their powers of producing other, and very different effeets from what he fuppofes, is more certain. Mr. Delaval, however, adopting for Isaac Newton's fuppofition, that acids always attend, and alkalies always incificate, prepared what he confidered as a diluving or attenuating liquor; which consisted of water with about $\frac{1}{4}$ part of aquafortis: and when he wanted to lessen the diluving force of this liquor, instead of weakening it by the addition of water (which would certainly have been the most obvious and unexceptionable expedition), he chose to do it, as he fays, by adding a fmall quantity of a solution of potas-
COLOUR.

...it, or some other alkaline liquor, and thereby produced a new composition, the effects of which, in many cases, prove different from those of a mere diminution of the supposed diffusing power of the former liquor. And on the other hand, when he wanted to increase the force of his acid liquor, instead of doing it by a farther addition of aquafortis (obviously the most proper expedient), he recurred to an addition of oil of vitriol, an acid possessing very different properties, and producing very different effects, on a great variety of substances, and particularly on colouring matters; of which we could easily allege hundreds of instances, but shall content ourselves with only mentioning what is well known, that even the strongest and most concentrated oil of vitriol (used to diflodge indigo for dyeing the Saxan blue, &c.) does not destroy, or even weaken, its blue colour, though a very weak nitrous acid, or aquafortis, will wholly destroy it, and convert the indigo to a dirty brown mass, of no use whatever."

For further observations of Dr. Bancroft on Mr. Delaval's Theory of Colours, we refer our readers to his abovementioned work.

But with respect to the practical part of the subject, viz. the art of colouring gluts, porcelain, &c. or the methods of forming pigments, they are requested to consult the articles, Painting, Enamelling, Dyeing, Staining, Crayons, and Pigments.

COLOUR of the clouds, is thus accounted for by Sir Isaac Newton. Concluding from a series of experiments, that the transparent parts of bodies, according to their several sizes, reflect rays of one colour, and transmit those of another; he hence observes, that when vapours are first raised, they are divided into parts, too small to cause any reflection at their surfaces, and therefore do not hinder the transparency of the air: but when they become so copious, in order to form drops of rain, and constitute globules of all intermediate sizes, these globules are capable of reflecting some colours, and transmitting others, and thus form clouds of various colours, according to their sizes. Mr. Melville controverts this doctrine, in its application to the red colour of the morning and evening clouds. "Why," he says, "should the particles of the clouds become at that particular time, and never at any other, of such a magnitude as to separate the red colour?" And why are they rarely, if ever, seen tinged with blue or green, as well as red, orange, or yellow? Is it not more credible, that the separation of rays is made in passing through the horizontal atmosphere, and that the clouds only reflect and transmit the sun's light, as any half-transparent coals would do? For since the atmosphere reflects a greater quantity of blue and violet rays than of the red, the sun's light transmitted through it ought to incline towards yellow, orange, or red; especially when it passeth through a long tract of air: and thus it is found, that the sun's horizontal light is tinged with a deep orange, and even red; and the colour becomes still deeper after sunset." Hence he concludes, that the clouds, according to their different altitudes, may assume all the variety of colours at sunset and setting, by passing reflecting the sun's incident light as they receive it. Edinb. Ed. vol. ii. p. 75. Priestley's Hist. of Volcan, p. 446, &c.

For the distinct properties, of the several colours, see Black, White, Blue, &c. See also Rainbow, &c.

COLOUR, and Colour Making, in Calico-Printing. The preparation of colours for calico-printing, constitutes one great branch of that beautiful art, and involves in it a series of interesting and important processes. As an art, its operations are not dependent on any other, on those minute differences and changes in the constitution of bodies, which it is the business of chemistry to investigate. Hence that liability to error and uncertainty which, in the hands of the ignorant, pervades many of its processes, though conducted according to long established and approved formulœ.

Our present volume would scarce suffice for the various receipts in which the art abounds; yet, in the following article, we shall endeavour to lay down general principles, rather than more practical directions; convinced, that by presenting our readers with a clear and concise theory, deduced from such practical illustrations, as may be necessary for this purpose, we shall render them a more acceptable service.

The term colour, as used in calico printing, is applied not only to those vegetable, animal, and mineral solutions, which impart their own colour to the cloth on which they are applied, but also improperly to those earthy or metallic solutions, which, poising little or no tincturing properties themselves, yet retain or fix the colours of other substances, when afterwards applied to the cloth. Thus the acetic of alum, or printers' red liquor, when pure, is almost colourless, and only becomes red by the process of dyeing, as will be explained hereafter. The acetic of iron, or iron liquor, in like manner, when used of a determinate strength, is called black colour, and when weaker purple colour, though the cloth impregnated with these solutions becomes black or purple, only as being raised, like the other, in the dye-copper.

1. The colours produced by means of these earthy or metallic solutions (which, in the language of science, are called mordants), form the most valuable and important series, whether considered with regard to the almost infinite variety of shades, or to their solidity and durability. These colours, from the mode in which they are produced, (the mordant being first applied to the cloth, and the colour afterwards raised by dyeing), are called dyed colours.

2. Sometimes the mordant is previously mixed with a solution of colouring matter, and in that state applied to the cloth, so as to paint or stain it, at one operation, and without the process of dyeing. Thus, another class of colours is produced, many of them poising great brilliancy indeed, but much inferior to the former in durability. The colours called chemical, by calico printers, belong chiefly to this class.

3. In the third and last class, we may place all those wherein the colouring matter is simply held in solution by an acid or alkali, and in this state applied to the cloth, without the intervention of any mordant. To one or other of the foregoing classes, may be referred all the colours used in calico printing; with the exception, however, of those solutions of colours which have been produced by calico printers in this country, within a short period, by processes, and upon principles which have hitherto not been made known.

Class I.

The colours of this, as has been already observed, are produced, by first impregnating the cloth with an earthy or metallic solution, or mordant, and raising the colour afterwards by dyeing. In this article we shall confine ourselves to the preparation of the different mordants, and the enumeration of colours they afford, with different colouring substances. The operations of the dye-houses, and the mode of raising the colours in the dye-copper, will be detailed hereafter.

The two great and most important mordants used in calico printing, are those that we have already noticed, viz. the fulminic acid, or acetic acid, and the vitriolic acid, or vitriol, and the aetous solution of alum, or the earth of alum, called red liquor, or red colour, and sometimes yellow liquor.

With these two solutions, either separately applied, and of
The cut into lengths of from eight to ten inches is preferable to any other. It is readily cleaned and more easily taken out of the vat, and returned into it again than misshapen masses fold under the name of old iron. When mule acid is employed, simple heating and washing is insufficient to free it from any fouling: it may have contracted in the vat; but when the pyroligneous acid has been used, it becomes so coated with resin on its upper surface after a second or third solution, as to prolong the period of saturation to twice or thrice its usual length. In this state it must be removed from the vat and heated to redness in oven, through which there is a current of air. The resin is confounded, and the iron by heating is freed from any remains of carbonaceous matter that may adhere to it, and is again ready for the vat.

The only objection to this mode of making iron liquor is the time required to saturate the acid, which to those, whose consumption is very great, or who manufacture it for sale, is oftentimes of importance. Different processes have therefore been devised to remedy this inconvenience, in many of which the saturation is accelerated by means of heat which is applied in various ways, as bell suits the convenience of the manufacturer; but the most expeditious mode is that of precipitating the iron to the acid in a flake of oxidation, by which means the solution is effected immediately. Calico printers have long been in the habit of using an extemporaneous acetate of iron, formed by mixing together solutions of acetate of lead and fulphate of iron. A very pure acetate of iron may be obtained by this means, but the price of acetate of lead renders this mode too expensive for general use. By forming a solution of lead, however, in pyroligneous acid and decomposing it with sulphate of iron or copperas, an iron liquor may be obtained sufficiently cheap to render this process advantageous in many cases, though still more expensive than the ordinary mode. A patent was lately taken out for making iron liquor by a process somewhat similar to this, which, however, we understand has not answered the expectation formed of it. A solution of lead in pyroligneous acid is digested on clear metallic iron. The iron becomes oxidised at the expense of the lead and is dissolved, whilst the lead is precipitated in the metallic state, and may again be used for a fresh solution. All these modes are evidently more expensive than the ordinary one of simple solution of metallic iron in pyroligneous acid, and the only consideration with the manufacturer is, whether this extra expense is counterbalanced by the economy of time or not.

The process adopted some years ago by Mr. Thomson, is perhaps the most expeditious, and next to the common mode, the most economical of any yet in use. It consists in saturating the pyroligneous acid with quicklime, and pouring the clear boiling solution on as much sulphate of iron or copperas as will precipitate the whole of the lime. A calk of iron liquor may be made by this mode in a few hours, and when ready has been taken as to proportion the ingredients so as to produce complete decomposition, it is inferior to no solution whatever in any of its properties.

The processes of the acetous solution of iron fit eminently above all others for the purpose of the calico printer, and having detailed its preparation we shall endeavour to point out in what this superiority consists.

The acetate of iron exists in two states, dependent on the quantity of oxygen combined with the iron. When pure, and recently prepared, it is of a pale greenish hue, but by exposure to air soon becomes tinged with brown. In this state the iron is at its lowest point of oxidation, strongly attractive of oxygen, and if precipitated by an alkali, of a deep green colour. By exposure to the atmosphere, and consequent
COLOUR.

Coarse absorption of air, the solution passes to a deep red brown, and, if concentrated, deposits orange oxyd of iron, and becomes strongly acidulous. With this excess of acid, the solution now becomes permanent; the iron is almost wholly at the maximum of oxygenation; and, when precipitated, of a dark red colour.

The same takes place only in a left degree, and more slowly with the sulphuric and muriatic solutions of iron. Of a pale greenish hue in their recent state, they gradually attract oxygen from the atmosphere, and become slightly red, deposit red oxyd of iron and pass to a state of acidity, at which the solution becomes permanent, and the oxygenation of the iron proceeds no further.

If the solutions, properly thickened with gum or flour, are applied to cloth, the same change takes place, but with more rapidity, from their diffusion over a thin surface, and more complete exposure to the air. The aqueous and volatile part of the solution speedily evaporates, and as the oxygenation goes on, the oxyd of iron is deposited on the cloth, and a portion of acid set free. When this acid is volatile, as is the case with the acetous, and also in a great degree with the muriatic, it is diffipated. The oxygenation of the iron then goes on, fresh portions of acid are again liberated and drawn off till the whole of the solution is decomposed, and the oxyd of iron deposited in the cloth.

When the acid is not volatile, however, as is the case with the sulphuric, the slight portions of acid that are liberated not being drawn off, the oxygenation proceeds more slowly till the excess of acid becomes so great as wholly to interrupt it, and great part of the iron in the operation of rinsing is again carried off the cloth. Another and more serious inconvenience attending the use of the sulphuric solution is its action on the cloth itself. The difengaged acid being in a state of great concentration acts upon its fibres, weakens, and at last destroys them. The same takes place with the muriatic solution also, for though the excess of acid is slowly diffipated, yet it has sufficient time and concentration to act very powerfully, and is, if possible, still more destructive than the sulphuric, since its action is not confined to the part on which it is applied, but from its volatility extends over the whole surface of the cloth.

It is necessary, therefore, that the acid should be not only volatile, but harmless in its action on the vegetable fibre, which conditions are more completely fulfilled by the acetous than by any other solution whatever. From the preceding observations on the properties of the acetous of iron, and the changes it undergoes on the surface of the cloth, may readily be deduced the reasons for that exposure to heat and air which calico printers have, from long experience, found necessary to goods printed with this solution. By exposure to air the iron becomes oxygenated and deposited on the cloth, whilst the heat favours the liberation of the acid, and accelerates the process. From what has gone before it may also be inferred, that the acetous of iron should be used in its recent or green state, since in that state the acetous acid is capable of holding a greater quantity of oxyd of iron in solution, and that consequently after its saturation and removal from the iron, it should not be too much exposed or agitated in contact with the air. On this account, also, it is wrong to pump the liquor in the vats too much when it approaches the point of saturation, since the oxygenated iron is almost all precipitated, and fresh portions immediately dissolved, so that the liquor might in time be rendered quite thick with precipitated oxyd of iron.

The preceding ideas are at variance with the general opinion respecting the state in which the acetous of iron should be employed. All the speculativ writers, and even many well acquainted with the processes of calico printing, recommend the oxygenation of the solution by exposure to air and removal from the iron, as essential to the goodness of the iron liquor. Even Bertholet, in the last edition of his "Elements of the Art of Dying," has fallen into the same mistake, the source of which, and the facts which seem to countenance it, we shall point out in a future article.

It is an object of importance to the calico printer to know the precise strength of his iron liquor, and to be able to ascertain this at all times, with little trouble or chance of error. Great mischief and inconvenience often arise from uncertainty in this respect, especially in the pale shades of purple, which are obtained from madder, with diluted acetous of iron. The hydrometer has been objected to, as indicating not merely the quantity of iron in a solution, but also the essential oil, resin, and mucilage which these impure solutions often contain. This objection, however, only applies where the same instrument and graduation is employed to ascertain the relative strengths of iron liquors, prepared with different acids, as the pyrogallic which contains much effluent oil and resin, and malt acid which abounds in mucilage. In this case the hydrometer may indicate great difference in solutions containing equal quantities of acid and iron, but varying in the quantities of mucilage, oil, or resin. Iron liquor, however, prepared constantly by the same process, and from the same acid, varies little in the relative proportion of its ingredients, that the hydrometer may be used to ascertain its strength in preference to any other mode whatever; provided the necessary precautions are used to correct any error arising from variation of temperature.

In a work of this kind, not illustrated by actual specimens, and without reference to some particular kind of iron liquor, it is impossible to point out the specific gravities of the different solutions required for producing the various shades, we have enumerated. An acetous of iron, of specific gravity 1.047, with madder or logwood, will produce a black, and with weld or sumac an olive, and diluted with, six, eight, or ten times its bulk of water, various shades of purple, drabs, or olives, according to the colouring matter employed. A standard solution of iron once obtained, the necessary strength for producing the different varieties of colour is easily ascertained by actual experiment, and to this we must refer our readers.

When thickened with flour or gum, and tinged with a decoction of logwood or Brazil, the better to enable the workman to observe the progress and state of his work, it forms, as we have before observed, the printers black colour, a purple colour, &c. according to the strength of the solution and the purpose it is intended for. Various ingredients were formerly added to iron liquor, to improve its quality, or vary the hue of colour it produced. Verdigris and copperas were added to the solution intended for black; and alum or nitre to the diluted solutions for purple. These are, however, now almost universally laid aside, as being for the most part useless, and often hurtful: the simple acetous of iron being found to answer every purpose of the more complicated and heterogeneous solutions.

The acetous of alum, or red liquor, is always prepared by the decomposition of alum, by an earthy or metallic salt, since the aluminous earth is not soluble in acetic acid, except in its newly precipitated and minutely divided state. The purest solution, and that which is generally used for the finest and most delicate colours, is produced by decomposing alum with Dutch fusar of lead, generally in the proportion of two parts by weight of the former, to one of the latter. The proportion of the two salts, and also the quantities of each gallon, as used by different calico printers, vary yet

2 with
with little difference in effect. The alun in general predominates so far as completely to saturate the liquor. The printers' alumino-mordant therefore is a compound solution. It is an aceto-sulphate of alumine, consisting of a saturated solution of common alun and more or less acetic acid, according to the quantity of furgar of lead employed. In the neighbourhood of London, the proportions are 6 lb. of alun, and 3 lb. of furgar of lead to a gallon of water: when these are completely dissolved, one ounce of Spanish white is added, and the whole briskly thinned till the effervescence has in great measure subsided. In a few hours the solution becomes clear, and forms a standard liquor from which, by greater or less dilution, may be obtained all the various shades of red, yellow, &c. already enumerated. In the above formula the proportion of alun is somewhat too great. A part of it remains undissolved, or immediately recrystallizes, and falls to the bottom along with the precipitated lead. This excess of alun is however strongly infixed on by many calico printers, as essential to the purity of the mordant, from an idea that the purest part of the alun only is taken up in the solution. This fact however may be readily disproved by employing this undissolved or recrystallized alun on the formation of true mordants, whose purity will be found in no respect inferior to the former. The purity of the alun and furgar of lead, and especially their being free from iron, is of great importance in the preparation of this mordant, and on this account the Dutch furgar of lead is preferred, but its high price renders it too expensive except for the pale reds of light chintz, and other kinds of work, whose great delicacy in the red tints is required. A substitute for it has been found in the solution of litharge in vinegar, or pyrogallic acid, which is afterwards decomposed by the addition of alun, and the excess of acid neutralized by Spanish white as in the former cafe. Great part of the acetic of alumine manufactured and sold under the name of red liquor is prepared in this manner. It is in general used for yellows, dark shades of red, and for those compound mordants into which the acetic of iron enters, and when its purity is of course of little consequence. The acetic of lime has long been substituted with great advantage by the writer of this article for the solution of lead, and its use is becoming daily more known and extended. When carefully prepared, it is far superior to the bell furgar of lead, and the impure solutions answer equally well, for the compound mordants before mentioned. The theory of these processes is the same in all. The object being to obtain a solution of alumine or earth of alun in acetic acid. On mixing acetic of lead, and sulphate of alumine together, a change of state takes place; the sulphuric acid unites with the lead, and falls down in the form of a white heavy precipitate, whilst the earth of alun combines with the acetic acid, and remains in solution. The same takes place with the solution of litharge in pyrogallic acid, which is indeed an acetic of lead, and when the acetic of lime is employed instead of lead, the sulphuric acid and lime unite and form an insoluble powder, which subsides, though less quickly than the other, whilst the acetic of alumine remains in solution above; the addition of the Spanish white is necessary to saturate a small excess of acid which exists in the solution. This excess is taken up by the lime, and immediately converted into acetic of alumine, by the decomposition of a fresh portion of alun.

The acetic of alumine when pure, is almost colourless. It has a slight acetic smell, and when boiling throws off acetic acid in great abundance, and deposits a portion of alumine. When evaporated it acquires a thick gummy consistency, but does not crystallize a property which gives it a decided advantage over common alun as a mordant. It unites readily with gum; but when concentrated and holding much alun in solution, forms with flour a watery pulpy kind of paste, which has little adhesion, and from which the fluid soon separates. The sulphuric salts have indeed all a disposition to injure the thickening quality of flour.

The affinity of cotton for the earth of alun, is so strong as to separate it from its combinations even with the mineral acids. When a solution of common alun properly thickened is applied to cloth, a portion of alumine unites with it, and the acid, which held it in solution, is set free. When this is accumulated to a certain degree, it prevents any further decomposition, and in rinsing carries off the greater part of the earth again. When the acid however is volatile, like the acetous and is dissolved as soon as diffigured, there being no longer any obstacle, the decomposition goes on till the whole of the acetic acid is driven off, and the alumine combined with the cloth. In the infancy of calico printing, and before the theory and constitution of the different mordants was properly understood, a variety of sublimates were added to the solution, some of which are retained to this day. Verdigris in the proportion of two ounces to a gallon, is recommended by many as tending to exalt the hue of yellows, and may in some cases be useful. Corrosive sublimates have been but lately laid aside, and the nitro-muriate of tin was long thought to give finity and brilliancy to reds, when used in a small proportion with the alunino-mordant. In general, however, the aceto-sulphate of alumine is found adequate to every purpose of the calico printer; we shall not therefore, perpetuate error by detailing any of those unmeaning mixtures which are still retained by the ignorant and prejudiced. These two mordants, the acetates of iron and alumine, and their various combinations, are those only in general use in calico-printing, for producing colour of the finest class. This application is so extensive, and the same time so simple, as to supersede the necessity of any other. The solutions of copper are sometimes used as mordants, but they afford colours of little solidity. The solutions of tin have also been employed, but we shall speak of these and other earthy and metallic solutions which have been used with partial success, when we come to treat of mordants in general.

Claf II.

In this class the colours are produced by combining a solution of colouring matter with some earthy or metallic salt, capable of giving it finity when applied to the cloth. The mordant and colouring matter are here applied at once, and the cloth is painted, as it were, or stained, with the colour it is intended to retain, and requires, in general, no farther operation than that of rinsing, to free it from the paste or gum with which it was thickened.

The colour of this class possessed, as we have before observed, in general great brilliancy, but wants that solidity and finity which characterised the colours of the former claf. The union of the mordant with the cloth is weakened by its previous combination with the colouring matter, and not being favoured by heat, as in the former claf: the triple combination of vegetable fibre, mordant, and colouring matter, wants that solidity which is so necessary to constitute what is called a fast colour.

Many of these, however, are sufficiently durable to be partially introduced, and intermixed with other colours of greater durability, and some are indispensably necessary, as no better mode has yet been devised of producing them. When the...
COLOUR.

chemical's art shall have discovered means of giving fixity to colours thus topically applied, the art of calico printing will have arrived at perfection. Systems of colours may then be combined, which are at present incompatible, and the tedious operation of dying and bleaching, with their attendant difficulties, be banished from the art. Nor is the hope so chimerical as might at first be imagined; several of the most useful and permanent colours are of this description, as will be shown hereafter.

We shall content ourselves with describing the leading and most useful colours of this class, giving, at the same time, the theory of their constitution. The mere enumeration of all the varieties that have or may be formed, would be endless, and foreign to our purpose.

Chemical Black.

This is the most useful colour of the class, and one of indispensible necessity in certain combinations of colours, where, for instance, it is mixed with drab, olive, and yellow, railed in the dye-copper with weld quatraron bark, or any similar colouring matter, and where the preface of any substance, such as logwood or madder, capable of producing a full black, would be ruinous to the other colours. A deep olive, approaching to black, might, indeed, be produced, by employing a strong iron liquor, as mordant, and using fumac in the dye-copper; yet as this would bear no comparison in point of intensity with the madder or logwood black, and as the force of the colouring in such course of work greatly depends on contrast, the topical or chemical black, which has all the intensity required, is almost constantly employed. The constitution of this black is pretty nearly the same in all the different forms in life. It consists always of a solution of iron combined with a solution of colouring matter generally of an alritrent nature. On the right proportion of these two solutions, and on their due specific gravity or strength depends, in a great measure, the goodness of the black.

1. If to a decoction of Aleppos galls, in five times their weight of water, made into a palte with flour, a solution of iron in nitrous acid of specific gravity 1.25 be added, in the proportion of one measure of nitrate of iron to eighteen or twenty of the former, a black will be formed fit for almost all the purposes of calico printing, and possessing the chief requisites of this colour, namely, tolerable fixity, and a disposition to work well with the black.

2. In lieu of nitrate of iron, some calico printers employ copperas, in the proportion of one pound to a gallon of the decoction of galls. Half the copperas is directed to be dissolved in the gal-liqour before it is thickened with flour; the remaining half, diffused by heat as much aquafortis as will cover it, is added afterwards. This black has tolerable fixity, but does not work so well as the preceding.

3. Copperas dissolved in various proportions of from four to twelve ounces per gallon, will form, with decoction of galls or logwood, blacks of less solidity indeed than the former, yet applicable, nevertheless, in many cases where the others are not.

The constitution of the two last mentioned blacks differs somewhat from the first. We shall point out this difference, and explain, as concisely as possible, the rationale of the foregoing processes.

When a solution of iron in nitrous acid is added to a decoction of galls, as in the first example, the solution is decomposed, the iron unites with the gallic acid and tannin principle, whilst the nitrous acid is diffused. This is proved by the blackness which the solutions assume immediately on being mixed. The difengaged acid, however, shortly reacts on the new compound, the blackness gradually disappears, and in a few days, if the nitrate of iron has been added in proper quantity, the pale, instead of black, is a dirty olive green. If the proportion of nitrate of iron is greater than this, the change will be effected sooner; and it is high as 2", the pale, when applied to the cloth, will be a bright orange, like the acetite of iron. By exposure to heat and air, this colour generally deepens, becomes grey, and at last a full black. In this state it is permanent, and adheres powerfully to the cloth. These changes of colour depend on the solution of the tannate and gallicate of iron in the difengaged nitrous acid, and the evaporation of the acid when exposed to heat and air on the cloth. This solution of the tannate and gallicate of iron is indeed a essential requisite in the goodnoss of the chemical black. If the difengaged acid is not sufficient to effect this, or if it is in too great a state of dilution, the colour has but a feeble adherence to the cloth; it is not preferred in a state favourable to its union with it, since the combination into which the iron has entered is insoluble in water. It acts merely on the surface, but does not penetrate its fibres, and yields readily in the various operations to which it is subjected. The chemical black, therefore, of the first example is a solution of the tannate and gallicate of iron in nitrous acid.

The black of the second, but more particularly of the third example, differs from the preceding in the circumstance of the iron in the solution being in a less oxygenated state. We may consider this black in its recent state as a mixed solution of green sulphate of iron, and gallic acid, and tannin principle; for the decomposition of the sulphate is not complete till by exposure to air on the cloth the iron becomes fully oxygenated. When this black is recently applied to the cloth, it is of a pale greyish colour, has little fixity, simple rinsing in cold water being sufficient to fetch nearly the whole away. By gradually absorbing oxygen, it becomes deeper, and at last black. The sulphuric acid has no longer any action on it, and is removed in the first operation in which it is immersed in water.

The decoction of galls used for chemical black is variously prepared. Many calico printers infuse the galls cold in casks of vinegar, or pyroglucose acid, suffering them to remain several months, occasionally drawing off the lower part, and returning it on the galls. Others steep them in wine. Both these modes are vicious, particularly the last. Simple boiling in water, till all the soluble matter is extracted is sufficient, taking care to imbibe the galls in a bucket, that when left they may not render the decoction thick.

Grey.

By diluting the chemical black of the first example with once, twice, thrice, &c. its bulk of water, and thickening the solution with gum, various shades of grey are obtained, which require rinsing off in water only, and the deeper shades of which have tolerable permanence.

The theory of these mixtures is the same as of the black, from whence they are derived. On the addition of water to the olive-green solution, mentioned in the preceding article, the colour instantaneously becomes deep purple, approaching to black. This is occasioned by the dilution of the free acid, which being no longer able to hold the tannate and gallicate of iron in solution, lets part of it at liberty, which instantly regains its colour. For this reason already alluded to, this has less adherence to cloth than that in which the solution is more perfect. The addition of a small quantity of nitrous acid effects this. The olive-green colour of the solution is restored, which,
which, by exposure to the air, and consequent evaporation of the acid, disappears, and leaves the tannate and gallate of iron more firmly fixed on the cloth. The complete precipitation of the combination is afterwards effected in the operation of rising off in water.

**Yellow.**

The false or chemical yellows are generally prepared with decoctions of French or Turkey berries, and sometimes with quercitron bark. The latter substance produces pale yellow or straw colour, but does not afford the deep bright orange yellow of the berries. Dr. Bancroft, to whom the public is indebted for the introduction and knowledge of this most useful dyeing drug; indeed, affords the contrary in his work on "Permanent Colours," and has given a receipt for the bark-yellow, which has, however, never succeeded in our hands.

**Berry-yellow.** Boil two pounds of good berries, lightly bruised, in a gallon of water during three hours, taking care to replace, from time to time, the evaporated water with liquor obtained from the second boiling of a former quantity of berries. When the liquor is cool, add to it eight ounces of alum, and if it is intended for the block thicken it with flour. If it is meant for those small objects in printed goods, which are generally touched with the pencil, two ounces of sugar of lead should be added with the alum, and the colour thickened with gum dragon. This yellow is generally passed through lime water as the first part of the operation of mordant; by this means the greater part of the earth of alum, which would otherwise have been carried off in the operation, is precipitated on the cloth, and the colour confiderably heightened.

When this operation of mordant cannot be performed without injury to some other colour, a greater proportion of sugar of lead should be added. This decomposes the alum, and forms an acetate of alumine, which being more readily decomposed by the colouring matter and the cotton than sulphate of alumine, does not require the assistance of an alkaline solution to precipitate it on the cloth.

The proportion of berries above directed is for a full yellow; one fourth or one-third less will form, with the same quantities of salts, yellows of great brightness. Some calico printers add a small quantity of nitrate of copper to the yellows intended to be simply rinsed off without mordant. This heightens the colour, but what is gained in intensity is lost in brightness; for if the solution of copper be added in sufficient quantity to produce any very perceptible effort, it imparts a desire to the hue which is very detrimental. This is the invariable effect of copper in any shape, whether the acetate, sulphate, or nitrate of copper be employed.

**Bark yellow.** For a lemon or straw colour, it will be sufficient to make a decoction of bark by boiling from four to six pounds in as much water as is necessary during two hours, and after evaporating down the decoction to one gallon, add to it two ounces of sugar of lead, and eight ounces of alum. If not limed, the proportion of sugar of lead should be doubled. For yellow greens, Dr. Bancroft directs the addition of both nitrate of copper and nitrate of lime in quantities so great, as near seven ounces of the former to a gallon of colour. Experience, however, though it has done justice to the merits of Dr. Bancroft's discovery of the use of quercitron bark, has not verified the expectations he had formed of it as a substitute for the Turkey berries in the topical or chemical yellow.

The constitution of these colours, whether formed with the sulphate and acetate of alumine, or with the solutions of copper is the same. Alumine, or the earth of alum, and the oxyd of copper, have an affinity both for colouring matter and vegetable fibre. They form the connecting link between these substances, which would otherwise counteract a feeble union. When a solution of alum is added to a decoction of berries or of bark, a light precipitation takes place by the union of a portion of colouring matter with the earth; the greater part however remains suspended or held in solution by the acid of the alum. When applied to the cloth the farther decomposition of the salt is aided by the affinity of this substance for alumine, and, when the acid is volatile, as the acetic for example, by its consequent evaporation. The same takes place with the solutions of copper. The operation of rinsing farther aids the precipitation of the colouring matter and alumine, by thus largely diluting with water; and lastly, when the goods are previously passed through the lime tube, the decomposition is complete, the last portions of earth or oxyd are precipitated, and the colour thereby considerably exalted.

The solutions of tin are capable of forming very bright and beautiful yellows, with decoctions of different yellow colouring substances; but the excess of acid which these solutions necessarily contain, and their powerful action on the cloth, renders their application less general than the preceding. The solution of tin most proper for yellows is the muriatic, and is formed by digesting, in a low heat for several days, the common muriatic acid, or spirits of salt, on fine grain tin. This solution, with bark, a pale and lively yellow, and with berries a yellow bordering more on orange. These spirit yellows, however, as they are improperly called, are seldom used except upon dyed grounds, and of this preparation for such purposes we shall treat at large under the head of Discharged Work.

**Blue.**

The only blue belonging to this class is that produced by combining the colouring matter of logwood with the oxyd of copper. It is but seldom used since the mode of dipping China blue has become generally known; and indeed its want of durability renders it of little value. It may be produced by combining almost any of the solutions of copper with a decoction of logwood.

1. Boil two pounds of logwood in a gallon of water, and to the decoction, thickened with gum, add eight ounces of sulphate of copper.

2. To a decoction of logwood as above, add two ounces of sulphate of copper, and two ounces of verdigrise.

Their colours may either be rinsed off or limed, as best suits the style of work. The theory of these combinations is the same as the preceding.

**Green.**

The chemical or false green is a compound colour, and consists of a mixture of a decoction of logwood and berries, or bark, and a solution of copper. Though fugitive, its use is in some degree authorized by the impossibility of obtaining a green of greater durability that can be applied in figures with the block. The fast green of the calico printers is the product of two operations, and it is of course limited in its application, and tedious in its use. The production of a fast green at one operation, or rather by one application to the cloth, either with the pencil, block, or press, is one of the great desiderata of calico printing.

1. One pound of logwood and two pound of berries boiled together during two hours, and strained whilst hot upon
upon two ounces of sulphate of copper, and two ounces of verdigris, and thickened with gum, form a good and lively green, the hue of which may be varied at pleasure by the increase or diminution of the proportion of logwood. To this same calico printer adds two ounces of common salt, and two ounces of sal ammoniac or acridulous sulphate of potash.

2. To one measure of blue of the first example in the preceding article, add two, three, four, &c. measures of a decoction of bark, made by boiling six pounds as before directed for the yellow, and to which, when reduced to one gallon, two ounces of sulphate of copper, and two ounces of verdigris have been added. The tone of the green depending on the relative proportions of blue and yellow, it is, in general, best to keep the two decoctions separate, to be mixed, when wanted, in such proportions as may best suit the purpose required. The theory of these mixtures is the same as of the blue and yellow already described. To the eye of the more speculative chemist, the addition of common salt and acridulous sulphate of potash in the first example, may appear unnecessary and unmeaning. They indeed affect little, either the hue or fixity of the colour, but experience has proved that this addition facilitates its working with the block, more especially when thickened with gum dragon. The cause of this, in the particular instance before us, is perhaps not very clear. The sulphur falls in general, such as the sulphates of alumina, iron, and copper, are all unfavourable to working, as their solutions, especially when concentrated, neither thicken well with flour nor gum. A saturated solution of copperas cannot be thickened with flour, nor can a strong solution of the aceto-sulphate of alumina, in which the alum is in great excess; even with gum it unites with difficulty. But if to a solution of copperas, which refines to form a paste with flour, a small portion of nitrate of iron be added, the whole forms a good and substantial paste that works admirably with the block; and half a pound of common salt added to the aceto-sulphate of alumina has a similar effect. In the instance more particularly before us, the addition of common salt forms a muriate of copper by the decomposition of the sulphate; but this salt is in too small a quantity to affect the working of the colour very sensibly. The cause of these effects is to be sought for in the very complicated play of affinities, which exist in such compounds, and which future investigation and discovery may perhaps unfold. The speculative philosopher, who is ignorant of the minute details of an art, that involves in it consideration and difficulties, unsuspected in the laboratory, will hence learn to suspend his judgment in deciding on the merits of a formula, till experience shall have proved the inferiority of those ingredients which theory would reject as absurd.

But to return to our subject, there is a wide field open for experiment and discovery in the production of greens, into which logwood does not enter. A calico printer near London, celebrated for his ingenuity and invention in colours of this class, has long employed a green which, from its beauty and durability, when compared with the foregoing colours, indicate the presence of indigo as a constituent part. Prussian blue in a minutely divided state, and mixed with bark or berry-yellow has been employed; but the blue in this case has so little adherence to the cloth, that mere mechanical force, the operation of rinsing and washing is sufficient to disengage it. With one or other of these substances, however, it is likely that greens much superior in beauty, and probably also in durability to those generally in use, might, by a series of patient and well conducted experiments, be readily obtained.

Pink.

The pale, and more delicate shades of red, belonging to this clafs, are chiefly sought after in calico printing. They are employed in giving relief to other colours, the effect of another colour taken in the shade of the colour-maker is exerted in giving them brilliancy and richness of tone. They are chiefly produced from decoctions of Brazil, Nicaragua, or peachwood, and cochineal, fixed, and fixed on the cloth with solutions of tin, rarely with the aluminous mordants, though delicate and lively colours may be produced this way.

The nitro-muriate of tin is chiefly employed, though the relative proportion of the two acids, and their degree of saturation with tin, varies almost with every calico printer. The solution itself, made according to established rules, and with the same properties, varies so considerably at different times, as wholly to alter the nature of its compounds, without any apparent cause of failure. The source of this discordance is to be sought for in the constitution of the solution itself, which, from caufts that we shall endeavour to explain, is subject to considerable variation.

H. R., from the strength or concentration of the acids employed, which are seldom uniform or constant; muriatic acid from the same manufacturer varying often in specific gravity from 1.12 to 1.18, and nitrous acid not less than from 1.15 to 1.23, without reference to the common diminution of single and double aquafortis.

When the specific gravity of the acid is neglected, as is but too generally the case, these differences occasion serious inconveniences in the use of solutions, whose properties often depend on the accuracy of their proportions, and on determinate degrees of saturation.

Secondly, from the impurity of the acids. The muriatic acid of commerce always contains iron and sulphuric acid; if the former exist in any notable proportion, it is unfit for the solution of tin; the presence of the latter is of great importance, though, on the whole, unfavourable to delicate colours. The nitrous acid varies considerably in its purity, being subject to greater or less admixture with the muriatic; the nitre is made from being field-mint free from marine salt. The aquafortis of commerce is, in fact, an aqua regia. This variation of the proportion of muriatic acid in the nitrous, is of the utmost importance, since the properties of the solution eminently depend upon this. With muriatic acid only, tin forms a colourless and permanent solution, one of whose distinguishing properties is, its strong affinity or attraction for oxygen. With decoction of cochineal, it forms a deep and dull purple-coloured precipitate, which, however, gradually loses oxygen, and becomes crimson, especially when exposed on the filter. With decoctions of Brazil and peachwood, it affords crimson precipitate, varying in intensity with their saturation with tin. It decomposes all the combinations of iron with colouring matter, deoxygenating the iron which it carries off, leaving the tin in combination with the colouring matter. Thus a madder black becomes a red on the application of muriate of tin. On this property is founded the art of printing on dyed grounds, of which we shall treat hereafter. With nitrous acid, unless very dilute, tin contracts a very feeble union, and is generally precipitated as soon as dissolved, in a state fully saturated with oxygen. The addition of a small quantity of muriatic acid renders this solution more permanent, provided it be not fully saturated with tin, and the addition of
of larger portions approximates the solution still more to the nature of the former, and renders it capable of supporting a greater degree of saturation. The properties of the solution depend greatly on the proportion of nitrilic acid, and consequent of nitrile of tin contained in it. When small, the precipitate with cochineal is bright crimson scarlet. It does not decompose the combinations of iron with colouring matter, unless the solution be far from saturation, and this effect is then due to the disengaged acid only.

The purity of the tin is another requisite which should be carefully attended to. The fine tin of Cornwall, commonly called grain tin, should be employed. If alloyed with lead, it is wholly unfit for these purposes.

In lieu of nitrilic acid, sal ammoniac and common salt are oftentimes employed to form an aqua regia with nitrous acid. The solution differs little from that formed by a mixture of the two acids, the allowance being made by the portion neutralized by the alkali of the neutral salt.

From this short outline of the history of the substances employed in the formation of the solutions of tin, and of the properties of the solutions themselves, may be deduced such general ideas as will elucidate and explain many anomalous effects in their combinations with different colouring matters, and seem to direct future experiment in the discovery of those minute, but often important, conditions necessary to the formation of particular shades of colour.

The following examples of spirit reds, as they are improperly called by colico prieters, will illustrate some of the preceding observations, and may be considered as specimens of the most beautiful and brilliant colours it is possible to form upon cotton.

1. Prepare an aqua regia by dissolving two oz. of sal ammoniac in one pound of nitrous acid of specific gravity 1.25. To this add two ounces of fine grain tin; decant it carefully off the sediment, and dilute it with \( \frac{1}{2} \) its weight of pure or distilled water.

2. One gallon of water add one pound of cochineal, ground as fine as flour; boil half an hour; then add two ounces of finely pulverized gum dragon, and two ounces of cream of tartar, and stir till the whole is dissolved. When the liquor is cool, add one measure of the preceding solution of tin, to two of the cochineal liquor, and incorporate well by stirring. Apply this with the pencil or block, suffer it to remain in the cloth six or eight hours, then rinse off in spring water. This colour will be a bright and beautiful scarlet.

3. Boil 12 pounds of Brazil chips during an hour in as much water as will cover them. Draw off the decoction, and pour on fresh water, and boil as before. Add the two liquors together, and evaporate slowly down to one gallon.

To the decoction whilst warm add four ounces of sal ammoniac, and as much gum dragon or fencag as will thicken it for the work required. When cool, add one of the solution of tin before described, to four, six, or eight of the Brazil liquor, according to the colour wanted. Boil it to remain from 18 to 24 hours on the cloth, then ruffle off in spring water as before. The colour will be a pale and delicate pink. If it is required deeper, the decoction must be made stronger, and used in the proportion of three or four to one of the solution of tin. Nicaragua or peachwood, though not so rich in colouring matter as Brazil, yields a colour, however, which is, if possible, more delicate and beautiful. The fine pinks produced by certain hoffies, which have for years been the envy and admiration of the trade, are afforded by this fine dye-wood.

These colours require no liming, simple affusion with water being sufficient to precipitate the colouring matter in combination with the tin. The theory of these mixtures is the same as the preceding. They require, however, a greater excess of acid to hold the colouring matter in solution. A decoction of cochineal poured into a saturated solution of tin, occasions an instant precipitation which is not disintegrated, and the greater part of which, if applied to cloth, would come off in the operation of rinsing. It is sometimes necessary to add a small quantity of nitrile of tin to prevent this precipitation, or to correct it when it happens; and sal ammoniac is supposed to have the same effect, probably by engaging the water of the solution.

With the aluminous fults, the decoction of cochineal and Brazil forms colours less brilliant than those we have just described, but which are applicable in cafes where the excess of acid in the solutions of tin is attended with inconvenience.

1. To one gallon of water, add eight ounces of finely ground cochineal, and two ounces of bruised galls; boil half an hour, strain the liquor whilst hot through a fine cloth, upon four ounces of cream of tartar and four ounces of gum, and thicken with gum dragon. This colour requires liming.

2. Upon 3 lbs. of Brazil, and 2 oz. of galls, pour one gallon of water, let them soak some time, then boil two hours, replacing the evaporated liquor with fresh water. Strain through a fine cloth upon 4 lbs. of gum fenegal, and add one pint of the acetate of alumine, described in a former part of this article.

The addition of galls in the two preceding formulæ is supposed to import solidity to the colours in some way analogous to the operation of galling in silk and cotton dyeing, of which we shall have occasion to speak hereafter. Their constitution is otherwise the same as the berry and bark yellows, and most others of this class of colours.

Purple.

1. If the solution of tin directed for the pink in the last article be mixed with six times its bulk of a decoction of logwood poured whilst hot upon four ounces of sal ammoniac, and 2½ lbs. gum fenegal, a bright and lively purple will be obtained, the hue of which varies with the strength of the decoction and the proportion of solution of tin employed.

2. If instead of the solution of tin, the acetate of alumine before alluded to, be used in various proportions of one-sixth, eight, &c. purples differing in shade and intensity will be formed, applicable in some cafes, but possessing less solidity than most of the colours already described.

The constitution of these compounds is the same as the preceding.

Olives.

Olives are variously compounded, according to the colour required.

1. By mixing chemical black in various proportions with berry or bark yellow. The depth and fulness of the olive depends on the quantity of black.

2. By a decoction of logwood added in greater or less quantity to the bark or berry yellow.

3. By the addition of copperas or nitrate of iron to decoctions of yellow or aluminium colouring matters, such as bark, sumac berries, weld, &c. each of these produces a different hue, varying from the green olive to a drab or cloth colour. By mixing these decoctions in different proportions, and by varying their strength, and the quantities of copperas
or nitrate of iron added to each, a multiplicity of shades may
be produced, of which it is impossible to convey any precise
or definite ideas.

These colours may be indifferently thickened with flour
or gum, as best suits the work required, but when nitrate of
iron is added to solutions containing gum, the instant coag-
ulation that takes place must be counteracted by the addition
of a portion of free nitrous acid. This effect arises from the
strong action exerted by metallic oxides, at the maximum
of oxidation, on mucilage or gum. When the decoction
is very concentrated, and contains sufficient colouring
matter to engage the whole of the iron, this effect takes
place in a lesser degree, but with solutions adapted to the
production of the foregoing colours, a coagulation invari-
able takes place, unless counteracted by the presence of a
portion of free acid. Of this action of metallic oxides on
the solution of gum we shall further treat under the article
Gum.

Clas III.

In this class, the colouring matter is simply held in solu-
tion, by an acid or alkali, and in that state applied to the
cloth without the intervention of any mordant.

The most important of these colours, is the alkaline solu-
tion of indigo, which forms the topical or.

Pencil Blue.

1. Prepared solution of pot-asf, by boiling together
7 lbs. of quick lime, and 15 lbs. of pot-asf, in 10 gallons of
water. Decant off the clear liquor, and separate the re-
mainder from the lime by means of the filter. To one
gallon of this solution, add 1 lb. of red arsenic, or orpiment,
and 1 lb. of fine indigo, both previously ground together in
a mill with sufficient water to form a thick paste. Bring
them up gradually to a boil, stirring carefully all the time,
and then withdraw the fire. Thicken the solution with the
best gum fenug, and for the pale shades of blue, dilute
with one, two, &c. measures of gum-water.

The quantities and relative proportions of pot-asf, orpi-
ment, and indigo in a gallon of pencil blue vary considerab-
ly with different calico printers, and within certain limits, it
appears, that the accuracy of these proportions is not of great
importance. Haussman, an intelligent French printer, em-
ployed 15 lbs. of pot-asf, 6 lbs. of orpiment, and 1 lb. of indigo,
to 12 gallons of water; and Oberkampf, proprietor of the
celebrated manufactory of Tony, a thil greater proportion of
indigo. Some printers add brown sugar, and Baneroff
has proposed to substitute this for the orpiment, but with-
out success.

The solution, when recently made, is a yellowish green,
but by exposure to air, becomes gradually deeper, and at
last blue. In this state, it is wholly unfit for use, it contracts
no union with the cloth, and is detached from it in the
first operation of mordanting.

Of the peculiar nature and properties of indigo, we shall
have occasion to treat hereafter, under its proper head, at
present it will suffice to observe, that it owes its colour and
infusibility in alkalies, to a portion of oxygen intimately
combined with it. To render it soluble, therefore, it must
be deprived of this oxygen, by the action of a substance
having a more powerful affinity for it, and the fulminating
of arsenic, or orpiment, is used for this purpose. Sulphate
of iron, has a strong affinity for oxygen, and is employed in
de-oxygenating indigo for certain purposes; but the oxyd
of iron not being soluble in alkalies, the solution of indigo,
formed by it, become quickly regenerated by the absorption
of oxygen, and cannot even be transferred from one vessel
to another. The sulhydure of arsenic, on the contrary being
very soluble in alkalies, precludes the double advantage of
de-oxygenating the indigo, and of retaining it awhile in that
state, till on its application to cloth, it becomes exposed to
the action of atmospheric air, as to regain its oxygen, colour,
and insolubility; and becomes fixed in its original or blue state.

The copper coloured pellicles, which forms on the surface
of pencil blue, and is renewed immediately on its removal,
arises from the abstraction of oxygen, which, in spite of the
action of the orpiment, is continually taking place. Hence
arises that disposition to unevenness, which is the great dis-
advantage of this blue; the unavoidable exposure to air of
small portions of the colour during its application with the
pencil, conferring greater or less portions of indigo, and con-
derably reducing its strength.

Most calico printers boil up the quicklimes with the other
ingredients, thinking its presence not less necessary than the
pot-asf and orpiment; by this means a considerable portion
of the solution of indigo is taken up by the sediment, which
caresl washing does not wholly separate. As the action
of the lime is confined merely to the alkali, which it renders
calcaeous, and capable of acting with greater force on the
other ingredients; it is certainly much more economical to
render the pot-asf caustic before its addition to the indigo.
A considerable waste of colour is by this means prevented,
and the solution may be thickened the moment the emulsion
has ceased without waiting for the deposition, which in the
old mode takes place.

Orange.

The oxyd of iron, when dissolved in acetic acid, forms
one of the most useful and important mordants, as we have
already shewn in the former part of this article. It is also
capable of imparting a very pleasing and permanent colour
to cotton, when applied in solutions of tolerable strength and purity, and forms the orange, buff, and gold
colour of the calico printers.

1. The solutions of iron in vinegar, strengthened by the
addition of copperas may be used, but the purest and
brightest gold colours are obtained from copperas and sugar
of lead, in the proportion of 3 lbs. of the former, and 1 lb.
of the latter, to a gallon of water. When thickened with gum,
and employed undiluted, it affords, when lined, a full strong
gold colour, and with two, four, six, &c. times its bulk of
water, various shades of orange and buff, which render
the action of air, alkalis, and soap; and are neither excited
than impaired by frequent washing. The addition of sugar
of lead, is to increase the strength of the solution. A gallon
of water dissolves about 4 lbs. of copperas. The addition
of a pound of sugar of lead, enables it to take up another
bount nearly, and the strength of the solution may be still
further increased by equal additions of the two last. The
operation of lining is a simple precipitation of the oxyd
of iron on the cloth, and in cases when this cannot be perform-
ed, the proportion of sugar of lead must be increased to
nearly that of the copperas. It is only the paler shades of
orange, however, which are to be obtained this way. The
deep 20.4 colour before named, is not to be procured with-
out the aid of a precipitant. Spanish brown is sometimes
added to a solution of iron, and employed in such a cafe,
but it contracts no union with the cloth, and is readily re-
moved by simple washing and beating. When the orange,
or gold colour, is thickened with flour, a small portion of
nitrate of iron must be added to the paste, for reasons we
have assigned on a former occasion.

2. A beautiful, but fugitive orange, is obtained by boil-

ing
ing half a pound of annotta with th. of caustic potash in a
gallon of water, and thickening the liquor with gum. This
colour acts powerfully on the seizes and blocks, which it
very soon destroys, and on this account, and also from its
want of permanence is seldom used. It may either be simply
rinsed off, or first passed through water rendered slightly
acidulous with sulphuric acid, or what is still better through
alum-water. This operation is the very reverse of liming,
for here the colouring matter to be precipitated, being held
in solution by an alkali, an acid must be employed for that
purpose. The colour by this means is considerably heighten-
ed, and when applied with the pencil, is useful in some cases
where the other colours will support the action of alum-water
without injury.

Borax, and even spirits of wine, are sometimes added to
the alkaline solution of annotta, and are supposed to contribu-
to its strength and fixity, though on what principle it is not easy to discover.

Green.

The oxyd of copper, dissolved in volatile alkali, affords a
delicate and pale green, which is sometimes employed inter-
mixed with other colours. Turnings of copper, or verde-
gris, which is more generally used, may be digested in a
low heat with spirits of salt anisone. Care must be taken
that the heat be very moderate, and the vessel in which the
solution is made, well stopped, the ammoniac will otherwise
be driven off, and lost. When the alkali has taken up as
much copper as it can dissolve, the solution must be thickened
with gum, and applied with the block or pencil. In a few
days the ammoniac evaporates and leaves the oxyd of copper
on the cloth, which must be rinsed to free it from the gum
and impertinent colour.

The blues produced by alternate immersion in copperas
and lime, and also in the solution of indigo, by the same
substances, properly come under this class of colour, as they
are solutions of colouring matter in lime and alkalis. As
the processes by which they are applied, differ however very
materially from all those that have been treating of, they
claim a separate and distinct notice. For the details of these
operations, and the mode of preparing the pastes for bark
and pale blue dipping, and the colours for China blue, we
must therefore refer our readers to the article Dipping
Blues.

COLOURS, in Dyeing.—There are five simple, primary, or
mother colours, used by the dyers: from the mixture where-
of all the other colours are formed; these are blue, red, yellow,
black, and brown colour; each of which fee under their
proper head, Blue, Red, &c.

Of these colours, mixed and combined, others are formed,
which are infinitely various. According to the propor-
tion of the different ingredients that are employed, or the
processes by which they are blended, thus a mixture of
blue and yellow forms green, which is distinguished by dyers
into a variety of shades, according to the depth of the shade,
or the prevalence of either of the component parts. Hence
we have sea-green, peas-green, pea green, &c. &c. Blue and
red form different shades of violet, purple, and blue. A mixture
of yellow and red produces orange. Mixtures of black
with other colours constitute grey, brown, and brown. For
a more particular account of these and other colours; and
the method of procuring and applying them; see the article
Dyeing. See also the preceding article.

The greatest perfection in the art of colours would be to
find the means of preparing the fixed colours without the
use of acid or alkaline salts, which usually subject
the colours to change, or else are apt to prey upon the
cloth, canvas, &c. as we see in verdigrise, the blue and green
crystals of copper, &c. It appears highly probable, that
the Indians, for making the fine bright and durable colours,
which with their chintzes and calicos are famed, make use
of metallic solutions; for some stained calicos, brought
from thence, having been kept 40 or 50 years, the bright
colours have been observed to eat out the cloth, exactly in
the same manner as acid spirits, which diffuse metals, are
found to do.

Since these, then, are the inseasonings attending such
colours, we ought to search for menstrums with which to
extract colours, which are neither acid nor alkaline; and for
such metallic oxides, precipitates, or powders, as will not
loose their colours, by being well washed to get out their
salts; to prepare certain metallic matters, by mere calcu-
lination, or the bare sufficiency of fire; and lastly, to look out
for native colours, wherein no saline matter abounds.

Mr. Geoffroy has given a very curious process for making
two clear, spirituous, inflammable liquids, which differ
very little in taste and smell, and being mixed together give
a fine carnation colour, without any sensible fermenta-
tion.

To make the first of these liquids, put a small handful of
dried red roses into a glass bottle; pour on them rectified
spirit of wine, till it covers them an inch; let this stand
in a cold infusion four or five hours; then pour off the liquor,
which will be clear and colourless, as when put on. The
second liquor is made by dropping into rectified spirit
of wine, a very much of sulphur, by the bell, or spirit of vitriol,
as will be borne in it without giving it any very sensible aci-
dity when tasted. When these liquors are thus prepared,
let a small quantity of the latter be dropped into some of the
former, and the whole will become of a fine carnation colour,
though there is no fermentation, nor any other change per-
ceived in it, but barely that of colour. If instead of this
balsam liquor, there be added to the first a few drops of the
spirit of salt ammoniac, the whole will become green.

Make a slight infusion of galls in water, so as not to co-
 colourful the water; make also a weak solution of green vitriol
in water, so that it may appear colourless; mix these two
colourless liquors together, and an inky blackness is imme-
diately produced; add to this black liquor a little oil of vi-
triol, and the liquor becomes pellucid and colourless again;
then add to this a little salt of tartar, and the whole is black
again.

Put a little bruised camphor into rectified clear oil of vi-
triol; shake the mixture, and it will become black, and
the camphor will be dissolved; add to this a little water, and
the liquor becomes clear, and the camphor is found separated
at top, in its own form, and native whiteness.

Infuse lignum nephriticum in cold water, and pour off the
clear liquor. This held up against the light, appears of a
fine yellow, but viewed from the light, of a beautiful
blue: a little spirit of nitre put to this liquor makes it
loose the power of reflecting the blue rays, and a little
oil of tartar, afterwards added, recovers that power again.

Logwood, infuse in water, gives a red colour. Put to
this a little spirit of urine, and it becomes of a fine purple;
and drop in afterwards a little spirit of salt, and it becomes of
a pale red.

A beautiful blue tincture may be made from filings of cop-
pper, by dissolving them in spirit of urine, hardnose, or the
like. The addition of oil of vitriol destroys the blue colour;
and a little spirit of salt turns it green.

Pellucid oil of vitriol, mixed with pellucid oil of turpen-
tine, produces a thick red balsam. And common oil, mix-
ed with fair water, by means of a little wax, and continued
rubbing,
rubbing, turns into a thick white balsam, called cold cream.

Oil of vitriol, distilled from quicksilver, leaves a white powder behind, which, if water be poured on it, becomes yellow.

Dissolve quicksilver in spirit of nitre, and to part of it add spirit of urine, and a white powder is precipitated; to another part of the solution add oil of tartar, and a yellow powder falls to the bottom.

Dip a new pen in spirit of vitriol, and write with it on common blue paper, and the letters will appear red.

A pelucid folution of fuscarem fuscum being written with on paper, becomes invisible when dry; but the base funes of an infusion of quicklime, and opiment, in water, will render the invisible writing black and legible.

Volatil fable fune ammoniac, which is white, mixed with cryall of copper, which are green, produce a fine purple.

The original and simple, as well as the mixt, colours are producible by mixture. Thus, if the fune's rays pafs through two pieces of glass, the one blue, and the other yellow, and be afterwards received upon a white paper, the colour there seen is green. The dyers make cloths blue with wood, and then turn it green by the yellow herb called lutecola, or dyers' weed. To a yellow folution of gold in aqua regia add a blue one of copper in spirit of urine, and the mixture becomes green. The painters every day prac-

tice this art of producing new colours by mixture.

Metalline and mineral matters are reducible to a considera-
able degree of finhty, or finialuets of parts by fire, or dry calcination, so as to leave them durably polished of their native or adventitious colours. Thus laptops lapis lazuli, by being calcined, becomes the fine rich blue called ultramarine; light ochre, by the same treatment, becomes a light red, or flesh colour, the most useful flesh-colour in painting. Lead, by calcination, becomes durably red, and iron durably brown; but a proper method seems wanting for the dry calcinations of the nobler metals, gold and silver; though, for the use of gilding, these are easily prepared by dipping linen rags in their respective solutions, and then drying, and burning them to ashes, whereby a dry and fine metalline powder is procured.

Colour, in Heraldry, the heraldic colours are nine, and were anciently expræfled by the word tinture. viz. or, argent, azure, gules, fable, vert, puerpur, tenney, and saufingue, and also by precious stones and planets; the auralial colours are blazoned in different terms, according to the rank and dignity of the persons whose arms are designed, as follows:

<table>
<thead>
<tr>
<th>Colour</th>
<th>For Commoners by Tinctures</th>
<th>For Peers by Precious Stones</th>
<th>For Emperors, Kings, and Princes, by Planets</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yellow</td>
<td>Or</td>
<td>Topaz</td>
<td>Sol</td>
</tr>
<tr>
<td>White</td>
<td>Argent</td>
<td>Pearl</td>
<td>Luna</td>
</tr>
<tr>
<td>Blue</td>
<td>Azure</td>
<td>Sapphire</td>
<td>Jupiter</td>
</tr>
<tr>
<td>Red</td>
<td>Gules</td>
<td>Ruby</td>
<td>Mars</td>
</tr>
<tr>
<td>Black</td>
<td>Sable</td>
<td>Diamond</td>
<td>Saturn</td>
</tr>
<tr>
<td>Green</td>
<td>Vert</td>
<td>Emerald</td>
<td>Venus</td>
</tr>
<tr>
<td>Purple</td>
<td>Puerpur</td>
<td>Amethyst</td>
<td>Mercury</td>
</tr>
<tr>
<td>Orange</td>
<td>Tenney</td>
<td>Jacinth</td>
<td>Dragon's head</td>
</tr>
<tr>
<td>Dark red</td>
<td>Sanguine</td>
<td>Sardox</td>
<td>Dragon's tail</td>
</tr>
</tbody>
</table>

For a fuller account of each, see under the respective heads.

Or, and argent are metals, and it is an invariable rule in heraldry not to put colour upon colour, or metal on metal; that is, if the field be of a colour, the charge or bearing must be of a metal.

Colour, in Law, is a probable or plausible plea; though in reality false at bottom; and only calculated to draw the trial of the cause from the jury to the judges: and, therefore colour ought to be matter of law, or doubtful to the jury.

In pleading it is a rule, that a man may be allowed to plead, specially, such a plea as amounts only to the general issue; but in such case he shall be driven to plead the general issue in terms, by which the whole question is referred to a jury. But if a defendant in an affrce action of trespass, be de-

formed for the validity of his title to the court rather than to the jury, he may state his title specially, and at the same time give colour to the plaintiff, or suppose him to have an appearance or colour of title, bad indeed in point of law, but of which the jury are not competent judges. As if his own true title be that he claims by sequestration, with livery from A. by force of which he entered on the lands in question, he cannot plead this by itself, as this plea amounts to no more than the general issue. But, he may allege this specially, provided he goes farther and says, that the plaintiff claiming by colour of a prior deed of sequestration, without livery, entered, upon whom he entered, and may then refer himself to the judgment of the court, which of the two titles is the best in point of law. (Dorfler and Student. 2. c. 57.) Every colour ought to have the following qualities.

1. It is to be doubtful to the jury, as in case of a deed of sequestrance pleased, and it is a doubt whether the land palfeth by the sequestrance, without livery or not. 2. Colour ought to have constancy though it wants effect. 3. It should be such colour, that, if it were effectual, would maintain the nature of the action, as in affrce, to find colour of freehold, &c. (10 Rep. 88, 90, and 91.) Colour must be such a thing, which is a good colour of title, and yet it is not any title. (Civ. Jac. 122.) If a man states his entry for such a cause as binds the plaintiff or his heirs for ever, he shall not give any colour; but if he pleads a defendant in bar, he must give colour, because this binds the possession, and not the title; so that when the matter of the plea bars the plaintiff of his right, no colour must be given. When the defendant entitles himself by the plaintiff, where a person pleads to the writ or to the action of the trial; he who jurifies for titles; or where the defendant jurifies as servant; in all these cases no colour ought to be given. (10 Rep. 91. Trut. 1343.) Where the defendant doth not make a special title to himself or any other, he ought to give colour to the plaintiff. (Civ. Eis. 76.) In trespass for taking and carrying away two hundred oaks of wood, &c. the defendant says, that A. B. was possessed of them, ut de bonis propriis, and that the plaintiff claiming them by colour of a deed after made, took them, and the defendant retook them and adjudged that the colour given to the plaintiff makes a good title to him, and confeceth the interest in him. (Lil. Abr. 275.)

Thus, c. gra. in an action of trespass for taking away the plaintiff's heads, the defendant urges, that before the plaintiff had any interest in them, he himself was possessed of them, as his proper goods; and delivered them to A. B. to deliver to him again, when, &c. and A. B. gave them to the plaintiff, and the plaintiff, by the property to be in A. B. at the time of the gift, took them, and the defendant took them again from the plaintiff, whereupon the plaintiff brings his action.—This is a good colour, and even a good plea. Dott, and Stud.

Colour of office, is when some unjust action is done under countenance of office or authority. See Bribery and Extortion.
To Colour stranger goods, is when a free man allows a foreigner to enter goods at the custom house in his name.

Colours, camp, are a sort of small colours painted on the right and left of the parade of a regiment when in the field. They are about 18 inches square, and of the colour of the facing of the regiment, with the number of the regiment marked on them. The poles, to which they are fixed, should be about 7 feet 6 inches long; except those of the quarter and rear guards, which ought to be about 9 feet long.

Colours, field. See Field.

Colours, guard. See Guard.

Colours used in the drawings of fortifications and military works, are chiefly Indian ink, carmine, verdigris, sap green, gum bich, Prussian blue, Indigo, indan, ultramarine, umber, sum color, which articles see separately, as well as the article Fortification.

Colours, Colours, in the Ancient Muses, was used to signify the musical species belonging to a genus.

In this sense the chromatic genus was laid to have three colours; and the diatonic two. The enharmonic, having no subordinate species, had but one colour. Hence the ancients reckoned three genera, and five colours, in music; namely, for every different divisions of the diatonic or fourth.

Colours, diatonic or musical scale of—In the course of Sir W. Newton's experiments on the properties of light, (Optics, book i. part ii. prop. 3.) he discovered the remarkable fact, that the spectrum of the sun's image, formed by a refracted light, let into a darkened room, is longitudinally divided by the points separating the different colours, viz., violet, indigo, blue, green, yellow, orange, and red into spaces which are respectively equal to $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, and $\frac{5}{5}$ parts of the double length of the spectrum, as is supposed. The spectrum to be 360 parts in length, then $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, and $\frac{5}{5}$ will represent the length of each colour respectively, and adding these successively in the reverse order, to $\frac{1}{5}$, we have $\frac{1}{5} + \frac{2}{5} + \frac{3}{5} + \frac{4}{5} + \frac{5}{5} = 2$, which, in their lowest terms, are $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, and $1$, and appear to be the diatonic ratios answering to the octave, minor seventh, major sixth, fifth, minor fourth, minor third, major second, and key note; or, to VIII, 7th, VI, V, 4th, 3d, II, and key, represented in the gamut by, c, b, a, g, f, e, d, and c.

From the experiences of Dr. Brougham, jun. efq. Philosophical Transactions, 1795, it appears, that not only by refraction, but by inclination, deflection, and reflection, the rays of light may be separated on a chart or screen; and he mentions numerous experiments, wherein the limits of the several colours on the spectrum were carefully marked with the point of a needle, after which the papers thus marked were put away, and a fresh paper subtillicated for other experiments: the measurement or comparison of the lengths of the intervals occupied by each colour on the different papers, being purposely deferred, until the whole course of experiments was completed, in order to prevent any preconceived opinions from operating in making the experiments: the results are represented as agreeing, in the spaces $\frac{1}{5}$, $\frac{2}{5}$, $\frac{3}{5}$, $\frac{4}{5}$, and $\frac{5}{5}$ occupied by the violet, indigo, blue, green, yellow, orange, and red colours, being the very same, as to arrangement, as those by refraction above-mentioned.

It is observable, that the notes composing the octave thus produced, do not answer to the major-key of bB as it might seem to do, although some writers on musical intervals have alleged, that nature produces only the major-key or division of the octave, and that the minor third bE or $\frac{5}{4}$ is nowhere to be found in nature. If we were to consider the chromatic ratios $\frac{3}{4}$, $\frac{5}{4}$, $\frac{7}{4}$, $\frac{9}{4}$, $\frac{11}{4}$, and $\frac{13}{4}$, we should have a different series of intervals, and a different division of the octave. It is not the intention of this article to enter into a discussion of the merits of the different systems of temperament, but merely to give an account of the effects produced by each, and to point out the advantages and disadvantages of each. It is evident, that the system of equal temperament, which is the most generally adopted, is the most convenient for musical purposes, and the most satisfactory for practical music, as it is the most equal, and the most commodious for the production of the desired sounds. It is also the most convenient for the production of the desired sounds, as it is the most equal, and the most commodious for the production of the desired sounds. It is also the most convenient for the production of the desired sounds, as it is the most equal, and the most commodious for the production of the desired sounds. It is also the most convenient for the production of the desired sounds, as it is the most equal, and the most commodious for the production of the desired sounds.

The principal colours used by painters, are red and white lead or ceruf; yellow and red ocre; several kinds of cartes, as amber, &c. besides ophirmin; black lead, casiar, gamboge, lake, bice, verditer, indigo, vermilion, ver- degris, ivory black, biliur, lamp black, smalt, ultramarine, and carmine; each of which, with the manner of preparing them, their uses, &c. see under their respective heads.

Of these colours, some are used in and in oil, others in fresco, others in water, and others only for miniature.

Colours, in an Ecclesiastical Sense, are used both in the Latin and Greek churches, to distinguish several mysteries and feasts celebrated therein.

In the Latin church are only regularly admitted five colours, viz., white, red, green, violet, and black: the white is for the mysteries of our Saviour, the feasts of the Virgin, those of the angels, saints, and confessors; the red for the mysteries and solemnities of the holy sacrifice, the feasts of the apostles and martyrs; the green for the time between Pentecost and Advent; and from Epiphany to Septuagesima; violet in Advent, Christmas, in vigils, vigils, and in votive masses in time of war; indigo, black for the dead, and the sacraments thence belonging. Cloths of gold and silver, and embroidery, are indiscriminately for all solemnities.

In the Greek church the use of colours is almost obliterated, as well as among us: red, among them, was the colour for Christmas, and the dead, as black is still for the laity among us.

Colours, Accidentals. See Accidentals.

Colours, Local. See Local.

Colours, rings of. See Rings.

Colours, water. See Water.

COLOURABLE title. See Title.

COLOURING, in Painting, one of the great component and essential parts of painting, is the art of giving to every object in a picture its true and proper hue, as it appears under all the various circumstances or combinations of light, middle-tint, and shadow; and of so blending and contrasting the colours, as to make each appear with the greatest advantage and beauty, at the same time that it contributes to the richness, the brilliancy, and the harmony of the whole.
It likewise possesses powers which, when judiciously applied, render it highly conducive to the character and expression of the subject represented.

A noble author, lord Lanfdowne, says, that verification is in poetry, what colouring is in painting, beautiful ornament, but the comparison is ill-founded. Verification is, indeed, an ornament; and so is colouring; but the former is necessarily the latter in the latter sense, necessary to the painter to enable him to make his imitation or representation complete. Should the most able painter in the world, says Mr. Webbe, attempt by that alone, a roe or grape, we should have but a faint and imperfect image; let him add to each its proper colours, we no longer doubt; we smell the rose, we touch the grape.

Colouring, like chiaro-scuro, may therefore be divided into kinds; that which is necessary for rendering the imitation just and intelligible, and that which is expedient or ornamental, as contributing to make the work at once more impressive to the imagination, and more harmonious and delightful to the eye. Truth in the local tints is alone required in the first kind; the second demands choice in their selection and distribution. For illustration, let us suppose the principal figure in a piece to be drest in sky-blue, and another figure near it, of lkea conflagrance in the story, to be represented in scarlet, with an under veilment of bright yellow, and let the light be made to strike equally on both: in such a case, it would be utterly impossible to give an effect agreeable or harmonious to the picture; although each of these objects should be painted with the utmost exactness and truth; nay, the combination, though found in nature itself, would excite feelings of difficulty and aversion: whereas, if the principal figure were drest in scarlet and white draperies, and the figure next it in blue of not too light or bold a tint, the effect would be harmonious and pleasing; and another point of great importance would be gained, as the eye would then be attracted by the principal figure, which could not have been the case in the former instance, where the gaudy combination of yellow and red must industriously, as is natural with all warm colours, have glorified the scene itself into notice. However, as the eye has the same intuitive abhorrence of harmonious combinations of colours, that the ear has of discordant sounds; it is, therefore, not surprising if we so seldom meet with enormities like the one above supposed, even in the works of the first artists who least of all can lay claim to the scientific arrangement of colours: to produce effects not harmonious, or disagreeable requires no great exertion of talent; but to perform all that can be done by the most skillful application of the various powers of the art is the lot of few.

In treating of chiaro-scuro, we have observed, that the part of it to which we have given the appellation of necessary or natural chiaro-scuro, was, in a greater or less degree understood and practised from the earliest period of the restoration of painting; the same was the case with respect to what we have termed necessary colouring, or truth in the local tints.

The oldest painters of Florence, Giotto, Buffalmace, and others; and still more, Simone Mammoli, Ambrogio Lorenzetti, and the rest of Siena-school of the same period, made frequently successful attempts at truth and even beauty in the tint of the flesh and other parts of their pictures; and figures produced a distribution of colours in no sense harmonious in the whole, though the prodigal style of gold grounds and gold ornaments bid defiance to an effect truly harmonious. Milpiero da Panicale, Mafaccio, Dominico Ghirlandajo, and Pietro Perugino, want much further, and we rarely find a want of delicacy of colouring in the parts of their pictures, or of harmony in the general effect. But this was not the result of a happy natural feeling for what was beautiful rather than of an approved and well-founded theory. It was not till the period when Leonardo da Vinci laid the foundation of an improved system of chiaroscuro, that the art of Venice began to revivify the beautiful effects resulting from the judicious combination or opposition of colours, at the same time that they attained a richness and truth in their local tints, far exceeding any thing hitherto practised. In both these qualities, however, they were soon far surpassed by their scholars, Georgione da Castel Franco, and Titian Vecelli, who, superadding to the most admirable richness of colour, the powerful light and shade of da Vinci, produced works in which, in their way, they have baffled all future attempts at improvement. The tone of colour of their pictures is not that of nature in her every day garb; it is ideal, like the chiaro-scuro of Coreggio or Rubens; that which may be supposed, but which, perhaps, is seldom or ever found in nature: the depth and mellowness of their tints can scarcely be accounted for but by the supposition of a tranquil but vigorous light shining through the heated atmosphere of a summer's evening. The world was astonished at this new style, and it is no wise suprising that Tintoretto, Paolo Veronese, and others who followed, being unable to do better, should attempt something different; the manly, the sober, temperamental dignity of Giorgione and Titian, was changed for magnificence, for show, for glitter, and for ornament; invention, composition, design, and expression, were all made subservient to the inordinate desire of effect of colour; the subject of the work could in many instances with difficulty be discovered, and their pictures may, in most cases, be compared to bewitching nonentities uttered by the silver tongue of the woman we love; to the sweet but fatal song of the Siren. There seems to be nothing in the colouring of Giorgione and Titian, incompatible with the greatest purity of design, sublimity of composition, or propriety of expression; but the splendid extravagances, the cased tints, the gaudy trappings of the more modern Venetians, are wholly inconsistent with true grandeur, and too frequently seem to remind the wretched effort of poverty to paragon opulence, or the disfuctions of the lacquey or courtier to cut the tinsel apparel the dignity of the nobleman, or the simple elegance of the woman of distinction.

While the two great founders of the Venetian school enraptured the eye by their transcendent and novel effects of colour, the Roman and Florentine painters, though principally applying their talents to the attainment of still higher objects, were not wholly unmindful of this part of the art. Many of the frescoes of Raphael in the Vatican, and in particular the dispute of the terracina, the St. Peter delivered out of prison, the mas of Bolsena, and the Hildoros, are fervently covered with the rich reds of Venetian tint, or with the pearly hue of Parme. However, from the latter works of this great master, it should appear that he did not at all times consider this branch of painting as worthy of his attentive regard. Fra Bartolomeo da San Marco, in his mandorla and apostle figure, aimed grandeur of design and breadth of chiaroscuro to a tone of colour at once dignified, tranquil, and harmonious; and Andrea del Sarto, except in some of his last works, where he in some degree adopted the gay and frivolous style then beginning to be in vogue, painted with a strength and sobriety of tint every way adopted to give increased interest and expression to the devotional or sacred subjects which he generally treated.
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At this period, as if nature then made holiday, and was prodigally lavish of her gifts, the great Coreggio appeared, and by his astonishing tricks in the cupolas, and other works at Parma, leamed to cast a new radiance on the world of art. In him the very soul of harmony reposed, and the magic of his pictures to infinitely intranced the eye, as to his renderings almost inescapable of discriminating, whether the astonishing effect is most the result of the breadth and softness of his chiaro-fucro, or the beautiful combinations and transitions of his colours. However, delicacy of tint seems to have been the aim of Coreggio; richness and luxuriance of colour that of the Venetians. And it has been observed of the great artist of Parma, that the flush in his pictures seems generally of too firm a texture, and to want that humid appearance, the result of inflexible transpiration, which forms one of the particular characteristics of human bodies, and which Titian and Giorgione succeeded so admirably in representing.

These are the great masters of colouring amongst the Italians. After this period a corrupt and frivolous style for some time predominated, and more particularly in the Roman and Florentine schools of painting. With them it was not uncommon to see yellow drapery shaded with purple, red ones with blue, or green with some other tint; as if it had been the intention to represent changeable flushes, and the eye seemed gradually to have become accustomed to the most unharmonious, the most gaudy and absurd combinations. Baroccio indeed made an effort to stem the torrent of this daltard taste. After having assiduously studied the works of Coreggio, he attempted to adopt his principle, and so far succeeded, that he deservedly has his admirers. But in the works of Baroccio, the red, the blue, and the yellow are too ostentatiously displayed, and want blending, which seems to justify the same critique on them that was made upon the works of Parrhasius, that his figures looked as if they had fed on roses.

The Venetian painters it is true, never entirely lost sight of the genuine principles of colouring; but even in this respect they fell far short of the great founders of their school above-mentioned, and the general frivolity of their taste, too frequently occasions even their merits to be passing by unregarded.

Coreggio had few followers; his divine spirit found not, like that of Donatello, a kindred place of abode amongst his successors; nevertheless, the Lombards preferred a certain richness and harmony of tint, which fluit in this particular, entitled them to a higher rank than their contemporaries of lower Italy. The Carracci, towards the latter part of the 16th century, rescued the art from the degeneracy into which it had fallen; and by uniting, as far as they were able, the different beauties of the Roman, Florentine, Lombard, and Venetian schools, produced a new style, and gave them to an academy eminent for the various talents which it called forth. Their colouring, however, is not so rich as the Venetian, nor so harmonious as that of Coreggio; but it is exempt from glaring defect, simple and tranquil, and well suited to the nobility and dignity of history painting.

Of Coreggio, their rival at Rome, it was hyperbolically said, that he dip't his pencil in flesh itself; but we have to regret that the black and opaque shadows which pervade his pictures, probably occasioned in some degree by the preferably nature of some colours which he used, destroy much of that truth of effect, which, from the Prefaces belloved on him in his life-time, we have grounds for supposing they originally possessed.

The pencil of Guercino is broad, and his tints fresh and vigorous, but his effect is generally more the result of chiaro-fucro than of any remarkably skillful arrangement of his colours.

The pictures of Guercino, in his first manner, possess considerable force of tint, but he afterwards abandoned this style of colouring, which he made of colouring weak and infipid; nevertheless, his grace, his knowledge of expression, and his unparalleled freedom of pencilling, gained him innumerable followers till at length, that which ought to have been considered one of his greatest faults, was numbered amongst his beauties. It is true, that shortly after this period, landscape was carried to the highest pitch of perfection by the Poullins, Salvator Rofa, and Claude Lorraine; the former giving to their pictures a style of colouring at once solemn and impressive, the latter a truth of aerial tint, never before or since attained. Nevertheless, a light and lively manner of colouring became one of the characteristics of the Italian schools, and the deferred daughter of Iris fought an asylum in the classic enemics of Flanders and Holland.

Amongst the Flemish painters, Rubens undoubtedly holds the first place; and his works, as Sir Joshua Reynolds observes, "have that peculiar property always attendant on genius, to attract attention, and enforce admiration, in spite of all their faults." This, however, is not the place for a general inquiry into his merits. With respect to his colouring, we have to observe, that it evinces that exuberance and boldness of genius, which in every other part of the art peculiarly characterises him. It possibles neither the sober richnes of Titian, nor the delicate harmony of Coreggio, but seems frequently, by the gorgous ammellation of tints, to vie with the gaiety of the charlet or ogrely. It is, however, a matter worthy of investigation, whether the great variety of colours, introduced by Rubens in the draperies and other parts of his pictures, has not, by the too great equality of their distribution, upon some occasions proved detrimental, rather than advantageous, to the richnes and splendour of effect, which at all times seems to have been his principal object; and whether that object would not have been more effectually attained, had he followed the preceedence of the early Venetians, in giving to two or three colours a more decided pre-eminence.

The style of Vandyke is more pure and chaste. The modest tendernes of his tints gently but irresistibly persuade; and his numerous portraits, by their deficyency and truth of expression, full captivate and interest the beholder, even where the perfomances they represent have been long buried in oblivion.

Rembrandt is, as Mr. Fuseli observes, a genius of the first clas in every thing which relates not to form; but though as a colourist he certainly holds a pre-eminent rank, the effect of his pictures is, perhaps, as we have said of Guercino, more the consequence of his altonishing chiaro-fucro, than of the frelhes of thehion and vigour of his tints. His works present not the gorgeous combinations of colour found in those of Rubens, or that liquid mellowness of tint in the flesh, so much admired in the pictures of Titian and Giorgione; nevertheless, they evince a most powerful conception of harmony, a beautiful gradation of tints, and great felociuity of tone. His lights have a brilliancy peculiarly his own; scarcely more owing to the powerful enpotation of his chiaro-fucro, than to the extraordinary method which he used of painting the luminous parts of his pictures with a very great body of colour in almost a dry mix; whilst his broad mades of shadow posses a magic transparency, making as it were darkneses visible.

It would be endless to enumerate the many admirable colourists of Flanders and Holland, who successively trod the
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footsteps of the great artists above-mentioned: indeed, there are few painters of those schools whose works may not be studied with advantage to this part of the art; the richness and harmony of their tints, the beauty and strength of their chiaroscuro, and the delicacy of their pencilling, comprise their chief excellence. Sir Joshua Reynolds, the great colourist of the last century, fully appreciated their merits; and by combining somewhat of their principle with the different styles of Titian and Coreggio, has succeeded in producing, in not a few instances, a richness and brilliancy of colour, inferior, perhaps, to neither, and, at the same time, different from all. Happy for his reputation, if from an inextinguishable desire of surpassing, he had not, in so many of his pictures, indulged himself in the use of colours and varnishes, which, like the more delicate blossoms of nature, are the earliest subject to decay.

We have been the more diffuse in our attempt to characterize the principal matters eminent for colouring, as we are aware that so little can be laid upon the preceptive part of this branch of art, which, more peculiarly than any other, seems to depend upon the delicacy and perfection of the organs of vision, and the nice discriminations of feeling and judgment. The great artist last-mentioned was perhaps the only colourist who ever wrote upon colouring, and we shall therefore have recourse to the effusion of his admirable discourse, in our attempt to give some idea of the leading principles of this part of the art.

It has already been observed, that chiaroscuro may exist in the greatest perfection, independently of colours; but colouring, without the aid of lights and shadows, would present us nothing more than the geographical chart or the harlequin's coat; and the study of it must therefore necessarily imply some previous knowledge of chiaroscuro.

In the commencement of the article we have, for the sake of distinction, divided colouring into two kinds: the necessary, and the expedient or ornamental: the necessary that which denotes truth in the local tints of the objects represented; the expedient or ornamental, that which is concerned in the distribution of the parts, and the harmony of the whole, depends. Although it might, upon first consideration, appear difficult to say, which of these two kinds or divisions of colouring requires the greatest exertion of talent; yet there seems little doubt but that examples of a very high degree of truth in the local tints in pictures, are more rarely met with than an equal measure of beauty in the general arrangement of the colours. To this truth of local tint, therefore, the utmost effort of the art should be directed; nature will be his best guide, and next to her the works of Giorgione, Titian, and Giacomo Daffano in figures, and those of Claude and some of the Dutch school in landscapes, and the other inferior departments of painting.

That species or division of colouring, which we have termed the expedient or ornamental, is of a very extended range, and may be compared to rhetoric, which gives additional lustre to truth, and enables the orator, even where proof is wanting, to support his argument upon fictitious Though falacious grounds. By a judicious opposition of one colour to another, the skilful painter is enabled to give to each an increased delicacy or an additional splendour; and by the same means a colour may be made to appear different from that which it really is; and thus a semblance of truth in the local tint may be frequently attained, even where that truth is in reality very far from existing. If the tint of the flesh be of too warm a hue, a yellow drapery placed next it, reiterates it to harmony; if too red, a crimson or a scarlet mantle takes away or diminishes the imperfection; if it appear cold, blue or purple opposed to it gives it a proportionable degree of warmth: and thus by contrasting one colour with another, the painter is enabled to give to each the degree of value he desires, according to his subject and the general effect of his work requires.

It was the custom of Rubens, when he wished to give brilliancy to the principal figures in his picture, to oppose to the flesh, a map of scarlet drapery, and another of pure white; by these means the tints of the solid parts acquired wonderful air of truth, at the same time that a splendid and harmonious effect was produced.

The balance of cold and warm colours in a picture seems to bear a strong affinity to the gradation or contrast of the chiaroscuro, and demands equal attention. "A certain quantity of cold colours," says Sir Joshua Reynolds, "is necessary to give value and lustre to the warm colours." He adds, "that the matter of light in a picture be always of a warm mellow colour, yellow, red, or a yellowish-white; and that the blue, the grey, or the green colours he kept almost entirely out of these masses, and be used only to support and set off these warm colours; and for this purpose a small proportion of cold colours will be sufficient." Let this conduct be reixed! continues this excellent writer, "let the light be cold, and the surrounding colours warm, as we often see in the works of the Roman and Florentine painters, and it will be out of the power of art, even in the hands of Rubens or Titian to make a picture splendid and harmonious. The illuminated parts of objects are in nature of a warmer tint than those that are in the shade: what I have recommended therefore is no more than that the same conduct be observed in the whole, which is acknowledged to be necessary in every individual part. It is presented to the eye the same effect as that which it has been accustomed to feel, which in this case, as in every other, will always produce beauty; no principle therefore in our art can be more certain, or is derived from a higher source."

We have treated of the doctrine of reflections in our observations on chiaroscuro; (see Clair, Obscur) it is proper, however, in this place to observe, that the body which receives a reflected light, receives, together with that light, somewhat of the colour of the object which gives the reflection, and this, in proportion to the strength of light on the body reflecting, and the vicinity of such body to that receiving the reflection. The skilful management of reflections is so inextinguishable a part of colouring, that it cannot employ too great a share of the student's attention; an excellent insight into the principles of it will be afforded him by the works of Rubens and Jordaens; and perhaps the least of the subjects having marked the reflections in their pictures with precision and distinctness, perhaps even beyond what is warranted by the appearances of nature herself.

With respect to the application of colouring, it should always be remembered, that like the other parts of the art, it is of a nature powerfully to contribute to the sentiment and expression of a picture; when the style adopted is in strict conformity with the character of the subject represented. This conformity is therefore the first thing to be considered. If the subject is awful or melancholy, a grave sombre tone of colour will be appropriate; if gay or magnificent, the most brilliant and gorgeous tints may be freely used. The dark hue given by Michelagnolo Buonarroti to his celebrated group in the boat, in the last judgment, with the cold light behind it, renders it perhaps not less a masterpiece of colour, than the Venus and Adonis of Titian, or the sleeping Nymphs of Rubens.
The following remarks of the author before cited seem highly applicable to the present purpose. "To give a general air of grandeur at first view, all trifling or artful play of little lights, or an attention to a variety of tints is to be avoided; a quietness and simplicity must reign over the whole work; to which a breadth of uniform and simple colour will very much contribute. Grandeur of effect is produced by two different ways, which seem entirely opposed to each other. One is, by reducing the colours to little more than chiaro-furo, which was often the practice of the Bolognian school; and the other, by making the colours very distinct and forcible, such as we see in those of Rome and Florence, but still the prevailing principle of both those manners is simplicity. Certainly nothing can be more simple than monotony; and the distinct blue, red, and yellow colours which are seen in the draperies of the Roman and Florentine schools, though they have not that kind of harmony which is produced by a variety of broken and transparent colours, have that effect of grandeur which was intended. Perhaps these distinct colours strike the mind more forcibly, from their not being any great union between them; as mortal music, which is intended to rouse the nobler passions, has its effect from the sudden and strongly marked transitions from one note to another, which that style of music requires; whilst in that which is intended to move the softer passions, the notes imperceptibly melt into one another."

It is not our intention here to detail the various modes adopted by artists in mixing their colours and varnishes, or the modes of preparing the different kinds of grounds used for painting on. Every school, and, more or less, every individual differs in his practice from another; and works of so high a class have been produced by each of these different methods, that we must conclude them all to be right, when rightly applied. However, in one point, the best colourists seem to agree, that the light parts of a picture should be painted with a strong body of colour, and the shadows with as much transparency as possible; and this is the more natural as well as the safest mode of procedure, as all the light colours, and particularly white, are opaque; whereas all the dark colours are in a greater or less degree transparent.

**Colouring of Glass.** See Glass.

**Colouring of Earthenware.** See Glazing.

**Colouring Matter.** For general account of the nature of colouring matter, see Dyeing, the art of; for the principal colouring materials, such as cochineal, indigo, madder, &c. see these articles respectively.

**Colouring of Porcelain.** See Porcelain.

**Colouring of Spirits.** See Spirits.

**COLPE.** In Ancient Geography, a town of Alia Minor, built, according to Pliny, in the place of Archopolis.

**COLPEDI, or COLPETI,** a people of Thrace, who inhabited the environs of Ænum. Steph. Byz.

**COLPISCH.** A name given by some to the fals Venetorum, or sickle-fish, commonly called the marmot fish by the people of Venice. See Falx.

**COLPODA.** In Zoology, a genus of animals (vermes infusoria) distinguished by being of a simple form, pellicid, flat, and finuate.

These worms are invisible to the naked eye. They have been discovered and examined, chiefly by Müller, Adams, Joblot, and other curious writers, whose attention has been particularly devoted to microscopical investigations. Of the genus colpoda, seven species only appear to be described.

**LAMELLA.** Elagated, membranaceous, and bent on the anterior part.

This resembles a long, narrow, pellicid membrane, which is narrower and obtuse behind, curved towards the upper part, and has a ridge or fold pelling through the middle. It is found in water, and when it moves is observed to proceed on the edge instead of flat surface. Found in common water.

**ROSTRUM.** O'long, and hooked on the anterior part. Discovered in water more pure than the former. The posterior part of this species is obtuse, and one of the edges from the top to the middle is dilated, thick, and apparently triangular.

**MELEAGRIS.** Changeable, with the anterior part hooked, and the posterior folded up.

Lives in water impregnated with vegetables, and is of a variable form, the anterior part clear, the posterior full of molecules, with the margin luminous.

**CUCULUS.** Oval, ventricose, with an incision beneath the tip.

Generally oval, and containing from eight to twenty-four bright molecules, the margin irregular. Common in a variety of vegetable infusions.

**REN.** Thick, and minutie in the middle.

Described by Jolot, who discovered it in the infusions of hay. The form is slightly kidney-shaped, of a yellow colour, opaque, and filled with molecules.

**PYRAM.** Convex, oval, the tip produced into a beak. The body is transparent, of a pale colour, and filled with molecules.

**HIPPOCREPS.** Thick, narrow in the middle, feblunus, and greenish. Found in flagmant meadow water.

**COPUSA.** In Ancient Geography, one of the ancient names of Chalcedon, according to Pliny.

**COSLA.** A town of Asia, placed by Ptolemy in Armenia.

**COSLIR.** In Geography, a town of Asia, in the country of Thibet; 50 miles N.E. of Harachar-Hiun.

**COLT.** In Zoology. See FOAL and HORSE.

**COLT'S foot.** In Botany. See Tussilago Farfara.

**Colt's foot.** Alpine. See Cacalia Potosif.

**CATHENA.** In Ancient Geography, placed by Ptolemy near the Araxes, and N. of Sidonians.

**COLTIE, among the Timber Merchants, a word used to express a tree which has a defect in some one of its annual circles, which renders it unfit for many of the uses it might have been otherwise fit for. In this case some one of the annual circles near the centre is perceived by the eye to be thicker than the rest, and its sap vessels larger. It has an appearance much different from that of the others, and is so loosely connected both to its involucrum, and invested circles, that, on faying a transverse piece of the trunk off, it will split off from the others, and to leave the heart loose, and the rest hollow, seeming to have been only fitt'd, not connected, to the others. In splitting the wood for other uses, it yet more readily drops out, and the timber of such a tree is therefore much less fit for general use than that of others. It is not easy to say to what accident, in the growth of the tree, this is owing, but it seems probable that it exposes the tree to other accidents; in particular Bobart seems to think, that among the trees which were split by the hard froiz, in the year 1687, while other trees of the like sizes and kinds escaped, this coltins might be the occasion of the mistaken, as well as of their being wind-shaken, or lagged. Philos. Trans. No 165.

**COLUMBIA.** In Ancient Geography, a people of India, placed by Ptolemy on the other side of the Ganges, and near to it.

**COLUMBA, in Zoology, a genus of serpents distingui

...shed
guised by having plates on the belly, and scales on the under parts of the tail.

The species of this genus are numerous. Linnaeus describes, upon the testimony of various writers, above ninety; and that number even has been considerably augmented by naturalists since his time. The species differ greatly in size and habit; some, as the vipers having the head large, flat-tish, and ferr-concorded, with the body and tail of a moderate length, or rather short; while others, as the greater part of the harmless serpents, have small heads, with the body and tail much longer in proportion. In some, exclusive of the usual scales under the tail, are a few feeta or unbrided lamelle, either at the beginning or towards the tip of the tail. The best works on this tribe of reptiles are "Synopsis methodica animalium Quadrupedum et Serpentium generis," of Ray; "Synopsis Reptilium," &c. of Laurenti; and those of Seba and Catesby. The observations of Boddaert, "Specimen novæ methodi distinguishendi Serpantia," Nov. Acc. Acad. Nat. Cur.; and "Betriebsfrendere Schlangen," &c. of Wiegel. The papers of Mr. Ellis, and another by Dr. Gray in the Philosophical Transactions, relative to venomous serpents, are also interesting. Several of those described by Count La Cepede deserve particular attention. Professor Pallis mentions some new kinds observed in Ruflia and Siberia; others are mentioned by Linnæus, and a number of the viper tribe occur in the "Historia of the Indian Serpents," published by the late Dr. Russell.

Linnaeus considered the number of abdominal plates and scales under the tail as a characteristic distinction of the different species of this genus; such, however, is the incongruity of this criterion that, in describing the same species, fearlessly two writers agree. Characters taken from the number of those plates and scales in the serpentine tribe, like those from the number of rays in the fins of fishes, are not to be relied upon. The colours are liable to some variation; but the peculiar form and disposition of the spots, lines, and other markings, afford, in general, a character by which the different species may be distinguished.

Species.

**Vipera.** Somewhat ferruginous; spotted with brown; beneath whitish; tail short and mucronated.


This is the common viper of Egypt. Haf- feh, who appears to have first described the species with accuracy, informs us, that it is imported in considerable quantities every year to Venice for the use of the apothecaries. Its size is somewhat smaller than that of the common viper; the head not so flat on the top, but very protrubent on each side; front very obtuse. The body is thick towards the middle, and somewhat quadrangular; but thin, and cylin- dric towards the head and tail, which is short, slender, conical, and terminated by a slightly incurved horn point or tip. The scales on the upper parts are oval and carinated. Haf- feh succinctly describes this species as being about two spans in length, exclusive of the tail, which measures only an inch. It is supposed by some to be the aip, by the bite of which the celebrated Chopratra determined rather to die than submit to be carried captive to Rome, to grace the triumph of Augustus. Mr. Bruce, on the contrary, considers the Crotalus to be the species employed on that momentous occasion. Schneider is of opinion, that the Egyptian viper (C. vipers) must be the true *Aphis* of the ancients, a reptile which was popularly reported to kill by occasioning the most excruciating thirst.

**Variegatus.** Above chestnut, variegated with grey and white; beneath, and on the sides, pale yellow. *Aphis variegatus, Laur. Amph. Seba, &c.*

Considered as a native of America, and resembles the last.


A native of America, and is probably only a variety of C. vipers.

**Intestinalis.** Body equal, slender, with a lateral and longitudinal dorsal line, the last furred near the eyes. Laur. Amph. Seba.

Inhabits Africa, and like the former is perhaps merely a variety of C. vipers.


This is the common English viper, and which is not only frequent in this country, but appears to be generally distributed over the rest of Europe, and some parts of Asia. If the varieties, described by Gmelin, are of the same species, it extends also as far as India. The variety of this author has the spots on the top of the head roundish, and somewhat confluent or running into a stripe; those near the tail transverse. This inhabits India. 3. Reddish with the head variegated; neck slender. A native of St. Eliface. 6. The arch of the hind head intercepting a white spot. Inhabits India. 1. Spot on the head multipartite. Inhabits the Celebes. The whole of these varieties are described and figured in the works of Seba.

Though the viper varies considerably in colour from a pale cinereous or yellowish ferruginous to deep or dull brown, the varieties agree in being marked with a continued series of confluent rhomboid blackish spots, extending from the head to the tail. The head is broad, and somewhat flattened, and more or less protuberant on each side at the back part; the front of the head is blackish, and on the upper part is a large divided and somewhat heart-shaped spot, the obverse divisions of which are directed backwards; the lips are somewhat barred or variegated with black and light grey, and along each side of the body runs a row of roundish subtriagonal dusky spots, continuing to the end of the tail. The scales on the upper part of the body are carinated, the under parts of a blackish colour, with a bluish gloss somewhat resembling that of polished steel. The general length of the viper is from eighteen inches to two feet, and it is ascertained by some writers to grow even to the length of three feet. The fangs of the viper, like those of other poisonous serpents, are situated on each side the fore part of the upper jaw, and are generally two in number, with a few smaller ones situated behind. The poison, as usual, lies in a receptacle at the base of the fangs, and being perforated, when the animal bites, the compression of those receptacles forces out a drop of the poisonous fluid, which prising through the aperture of the fangs is immediately inhaled into the wound. The tongue is forked, and being soft and flexible is susceptible of great extension; it may be perhaps superfluous to add that this tongue is altogether incapable of inflicting any wound, or injecting poison, as some ancient writers credulously affirm; it may affix the animal in the capture of its infect prey. The French naturalists are inclined to believe it is intended by nature to supply some detect of transpiration in the skin. Hitherto the viper has been considered the most poisonous of
of the European serpents, and many instances are recorded of the fatal effects resulting from its bite. That the bite of this serpent is always protracted of pain and temporary inflammation in the parts bitten is very evident; sometimes also the symptoms may become alarming, or, in a few instances, through neglect or injudicious treatment of the wound, may even prove fatal; but upon the whole the bite of this creature does not appear pregnant with all those dangers which the terrene and prejudices of the vulgar lead them to suppose. In England the bite of the viper is rarely attended with fatal consequences. Fontana seems to doubt whether any well attested instance can be adduced of the viper having killed any person by its bite, even in the warm climate of Italy. The testimonies of authors, both as to the nature of the poison itself, and its effects on the animal frame are, however, confessedly at variance. According to Dr. Mead, and his associates in the experiment, the poison of the viper, diluted with a little warm water, proved sharp and fiery when taken with the tip of the tongue, as if the tongue had been struck through with something scalding or burning. This sensation went off in two or three hours; but one gentleman, who would not be satisfied without trying a large drop undiluted, the animal and drink, found his face swelled with a slight inflammation; and the forenoon lasted two days. On the contrary, abbe Fontana and some others describe it as of no particular acrimony of taste, but rather resembling oil or gum, and Dr. Ruffell, in his work on Indian serpents, affirms the same even of the poison of the cobra de capello. Barthaeva is of opinion that the poison of the viper may be taken into the stomach without danger, and quotes the case of Jacob Sozzi, who, at the court of the duke of Tuscany, is said to have swallowed three drams of this poison without experiencing any ill effects. This poison, says Barthaeva, is rendered inactive by digestion in the stomach and bowels, so that it will not afterwards exert its fatal effects upon the blood; for a whole ounce of the venom taken by the mouth will not kill an animal, when, at the same time, a small needle only, dipped in the same fluid, taking up perhaps no more than a hundredth part of a drop, and then thrust into the blood of the living animal, almost infallibly kills. Fontana, on the contrary, affirms, that though the poison of the viper administered internally may not produce the same violent symptoms as the bite, that it cannot be taken with impunity. The opinion, pretty generally entertained among the ancients, seems to be in favour of the assertions of Barthaeva.

The symptoms which follow the bite of the viper (according to Dr. Mead) when it falls on one or both of the greater teeth or fangs in any part of the body, is an acute pain in the part wounded, with a swelling at first red, but afterwards livid, which, by degrees, spreads further to the neighbouring parts, and occasions great pain, and a quick, though low and sometimes interrupted pulse; great sickness at the stomach, with bilious, convulsive vomitings, cold sweats, and sometimes pain about the navels; and if the cure be not speedy, death itself, unless the strength of nature prove sufficient to overcome those disorders: and though it does, the swelling still continues inflamed for some time; nay, in some cases, more considerably upon the abating of the other symptoms than at the beginning; and often from the small wound runs a fangious liquor, and little pustules are raised about it; the colour of the whole skin, in less than an hour, is changed yellow, as if the patient had the jaundice. These mischiefs (although different climates, feaons of the year more or less hot, the greater or less rage of the viper, the animal itself being of a larger or smaller size, and consequently able to communicate more or less venom, the wound made deeper, in a part more nervous or tendinous, and therefore receiving more of the poiforous liquor, and the like circumstances may vary the heighten or abate them) yet usually dexter themselves much after the same manner in all; yule's the bite happen not to be accompanied with the effluvium of that liquor, which is the main instrument and cause of this violent and shocking disturbance." Dr. Mead caus'd several animals, as dogs, cats, and pigeons to be bitten by an enraged viper, which animals generally died, some in a longer and others in a shorter space of time; but it was observed that, immediately after the bite, they all exhibited signs of acute pain as if affected with rickards, painterings, and convolutions. The venomous properties of the poiforous fluid of the viper is not destroyed even by the death of the animal, as was proved by Dr. Mead; he took the head of a large viper that lay three hours after it was cut off, and was perfectly plac'd and without motion, and wound a pigeon on the thigh by the fangs of the head; the bird presently became convulsed, and died seven hours after. The Scythians, as Pliny relates, must have been aware that the poison of the viper would retain its venomous properties after being taken from the animal and dried; for they were accustomed to dip their arrows into its poison; this they previously prepared by mixing it with human blood.

From the following experiment it would seem that no very material difference takes place in the appearance of an animal killed by the bite of the viper, than if its death were occasioned by any other cause. To ascertain this fact, a viper, being enraged by the members of the Tufcane academy, and then suffered to bite the nose of a strong bull, the animal expired in a short time, and being opened by the most expert anatomists, no uncommon alteration could be perceived either in the solid or fluid parts of the beast.

The viper, though so much dreaded on account of its bite has been very highly esteemed both by the ancients and moderns as a retorizare and strengthening diet. The ancients used the flesh of this snake in lapis and other cales. The Greek physician Ctesorus, cured, as Porphyrius relates, a miserable slave, whose skin, in a strange manner, fell off from his bones, by advising him to feed on viper's flesh in the manner of lin. Galen says, that those afflicted with elephantiasis are wonderfully relieved by eating viper's flesh dried like eels, and relishes very remarkable cures of this disease performed by means of viper wine. In France and Italy, the broth, jelly, and flesh of vipers is in much esteem as a restorative medicine. In England we have to induce the well known circumstance of Sir Kenelm Digby, who caused his wife Lady Veneta to feed on eels, and vipers to recover her from a consumption. According to Dr. Lewis, the dried flesh of the vipers piffles none of the nutritious properties of the recent animal, and is totally insignificant. A volatile salt was formerly drawn from vipers and sold at a great price as a sovereign remedy against the bites of vipers, and other venomous animals, but it is now found not to be materially different from the volatile alkaline salts procured by chilling other animal substances.

The viper abounds most in dry, rocky, and chalky countries, or in the low herbage or underwood in thickets. It eats its skin twice in the year, namely, in spring and autumn, and is laid to attain its full size at the age of six or seven years, but are capable of engendering when two or three years old. They copulate in May, and go about three months with young. "The viper (I. v. Mr. White) is viviparous, producing its young towards the close of summer. On the 4th of Aug. 1752, we furnished a large
a large female viper, which seemed very heavy and bloated as it lay on the grass, basking in the sun. When we came to cut it up, we found that the abdomen was crowded with young, fifteen in number; the shortest of which measured full seven inches, and were about the size of full grown earth worms. This little fry shone into the world with the true viper spirit about them, flowing great streams as soon as disencaged from the belly of the dam; they tore and wriggled about, and let themselves up, and were very wide, when touched with a bick, flowing numerous jets of menaces and disdain, though as yet they had no manner of fangs that we could find, even with the help of our glasses. 1 The man in Mr. White's female viper was oviparous, which had in it a chain of eleven eggs, about the size of those of a black bird, but not so far advanced as to show the rudiments of the young. Several intelligent folks (adds Mr. White) assure me that they have seen the viper open her mouth, and admit her hebebs young down her throat on sudden surprizes, just as the opilion does her brood into the pouch under her belly upon the like emergencies; and yet the London viper catchers inful on it to Mr. Barringer that no such thing ever happens. Sir Thomas Brown feels inclined to believe this circumstance: the young, he observes, (supposed to break through the belly of the dam, will, upon any fright, for protection, run into it; for then the old one receives them into her mouth, which way, the fright being past, they will return again, which is a peculiar way of refuge, and although it seems strange is avoided by frequent experience and undeniable testimony. The fame is opposed by some other writers of no mean repectability.

The enemies of the viper are numerous, the herons in particular destroy vast numbers. Their prey consists of frogs, toads, lizards, mice, and various small quadrupeds. The viper is capable of supporting a very long abstinence; it being known that some have been kept in a box without food for six months, and yet did not abate of their vigour. They feed only for a short period annually, and as a viper has been known to be a whole month devouring and digesting a frog or toad, two such meals would be sufficient to support it for a twelve month. It is remarked, that they never eat during confinement, for if mice, their favourite food be thrown into their box, though they will kill they never eat them. The violence of their poison decreases in proportion to the length of their confinement. Vipers, when at liberty, remain torpid throughout the winter, but when confined have never been known to take their annual repose. The best method of catching them is by putting a cleft stick on or near the head, then laying them by the tail, and instantly dropping them into a bag. The viper catchers are frequently bit, but it is seldom the wound proves fatal: oil of olive, or cod liver oil, is said to be the most effectual remedy. M. Sonnini seems fully satisfied of the efficacy of eau de luce as an antidote to the poison of vipers as well as other venomous serpents, the good effects of which he tells us he has experienced on several occasions, and particularly at Guiama, where snakes are equal in number and formidable. In his travels through Greece and Turkey, M. Sonnini mentions an instance of a child he saw at Sisifour, three or four hours after it had been bitten by a viper or venomous snake, in the small of the leg. Both the leg and foot were much swollen, very hard, and of a blueish colour: the child suffered great pain, the wound no longer appeared, and the place was not distinguished but by a larger swelling, and by pains more acute, which were occasioned by touching it. He made the child swallow a few drops of eau de luce in half a glass of wine, and after some scarifications on the part bitten applied to it, a compress, steeped in this same water, which is known to be composed of volatile alkali and oil of amber. The result of this treatment was, that four hours after, the swelling was considerably diminished; the child no longer felt any pain; it became tranquil; the compress of eau de luce was removed, and the child left in a fair state for recovery. The true application is recommended by Sonnini in all his places; he observes, that the swelling of the wounded part is rapidly diminished, and the pain entirely removed in two hours: but the eau de luce must be taken internally, according to this writer, as well as applied to the wound externally, in order to proct the desired effect. The remedy which the Greeks commonly employ for curing the bite of snakes, as 3 smaller olives, boiled in cataplasms of excellent plants, calculated to promote suppuration. Now there is reckoned among them to poisons, particularly, a species virtue against this sort of venon. But this treatment, he adds, is very long; it frequently lasts two months, and never leaves the person; whether it is always successful, and do not nearly carry off the patient from the torments which this mode of treatment causes him to feel.


This is the black viper of English authors, and which so completely resembles the common viper in every particular, except the colour, that we are strongly inclined to admit it as a mere variety of that species. The black viper of Austria appears from a series of experiments made by Laurenti to be innocuous, since pigeons and chickens exposed to its bite were not otherwise injured than by mere puncture without suffering any symptoms of poison, but it is not entirely certain that the kind determined by Laurenti is of the same species as the black viper generally found in Europe, and which is almost universally allowed to be as poisonous as the common viper.


This is the common vipera, but of a much thicker skin, and entirely of a milky black colour; it is venomous in its nature, and, when irritated, exudes the venom which is naturally kept in a large black sac, and threatening at the same time with a horrid hiss: the fangs are large, and the animal is said to be as dangerous as the rattle snake.

It is a native of Carolina, inhabiting chiefly the higher grounds.

CRESSEA. Daily-bay, with black flexures dorsal hard, and the head oval, and whitish beneath. Coluber durfa, abdominal tests 150, subcaudal scale 34. Linna.

Habits the woody parts of Sweden, and is said to be most frequent in the province of Smaland, where it is greatly dreaded by the inhabitants, who consider its bite as mortal, unless the part bitten be immediately cut out. In the "Memoirs of the Swedish Academy" is an account of a young man, a labourer, hit by this animal on the toe of the left foot. In the space of six hours, the whole leg and thigh were red and swelled; the pulse intermittent, and the patient was oppressed with pains in the head and bowels. The first day the patient drank a glass of the juice expressed from ash leaves mixed with wine every half hour, and had besides a caraplain of the bruised leaves applied
to the wound; in the evening also, he took a glass of warm olive oil. By these means the patient was greatly relieved, slept well during the night, and found the swelling much reduced by the next morning; but neglecting to repeat the remedies the third symptoms returned, and were again diffused by the same applications, and in two or three days the patient recovered. Linneus attempted to cure a woman wounded by the bite of a viper of the kind by means of olive oil, but his endeavours were uneffectual, and his patient died.

The cobra eberiæa resembles the common viper, but still more to the common adder, though inferior in size, not often exceeding a foot in length. The colour is a dusky rufous brown, with a flaxen dextral band of a deeper colour; the head vernal, of a pale colour, and marked with a heart-shaped dusky spot, the divisions of which are directed backwards, and the body is round.

Scytha. Deep black above, beneath milk white, and polished. Coluber fyslb, abdominal fecca 153, subcu baud. Ams. 31. Palus L. Inhabits woods in the mountainous parts of Siberia, where it was observed by Dr. Pallus. This species is not esteemed very poisonous, and is of a small size, seldom exceeding nine inches in length, or the thickness of a finger; the head is somewhat heart-shaped.

Red. Head imbricated with very minute scales; body ferruginous, with a quadruple transverse dorsal series of short brown streaks. Coluber redi, abdominal fecca 153, subcu baud. Ams. 31. Palus L. Inhabits woods in the mountainous parts of Siberia, where it was observed by Dr. Pallus. This species is not esteemed very poisonous, and is of a small size, seldom exceeding nine inches in length, or the thickness of a finger; the head is somewhat heart-shaped.

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fell; till one of the people who brought them to us, came near him, and though in a very disadvantageous posture, flicking, as it were, perpendicular to the side of the box, he leaped near the distance of three feet, and fastened between the man's forefinger and thumb, so as to bring the blood. The man showed no sign of either pain or fear, and Mr. Bruce and his party kept him with them full four hours without his applying any sort of remedy, or seeming inclined to do so. To make himself assured that the animal was in its perfect state, Mr. Bruce made the man hold the cerastes by the neck, so as to force him to open his mouth, and lacerate the thigh of a pelican, a bird he had tamed as large as a fawn. The bird died in about thirteen minutes, though it was apparently affected in about fifteen seconds, and this even can scarce be considered as a fair trial, because a few minutes before it had bit the man, and so discharged part of its venom, and it was made to scratch the pelican by force, without any irritation or action of its own.

It appears not only on the testimony of the above circumstances, but on the relations of travellers in general of the greatest respectability, that the natives of the countries inflected by the cerastes, have a method of charming, or rather stupefying these and other serpents to prevent their biting, or to render their bite innocuous, however irritated the animal may be. Some pretend to posses preternatural powers over these reptiles, while others say, they have certain preparations with which they anoint themselves to obviate the fatal consequences of their bite, and which is never ineffectually employed. Mr. Bruce speaks at some length on this interesting topic "a long dissertation (lays this writer,) would remain on the incantation of serpents. There is no doubt of its reality, the scriptures are full of it, all that have been in Egypt have seen as many different instances as they chose. Some have doubted that it was a trick, and that the animals so handled, had been first trained and then disarmed of their power of hurting; and, fond of their discovery, they have ruffled themselves upon it without experiment, in the face of all antiquity. But I will not hesitate to aver that I have seen at Cairo, (and this may be seen daily without trouble or expense) a man who came from above the catacombs, where the pits of the mummy birds are kept, who has taken a cerastes with his naked hand, from a number of others lying at the bottom of the tub, has put it upon his bare head, covered it with the common red cap he wears, then taken it out, put it in his breast and tied it about his neck like a necklace; after which it has been applied to a hen and bit it, which has died in a few minutes; and, to complete the experiment, the man has taken it by the neck, and beginning at the tail has ate it as one would do a carrot, or flock of celery, without any seeming repugnance."

"We know from history, that where any country has been remarkably inflected with serpents, there the people have been circumcised by this secret. The Phylli and Marma-rides of old, undoubtedly were defended in this manner."

"Ad quorum cantus mitis jacuer e caralcte."

SIL. ITAL. LIB. III.

"To leave ancient history, I can myself avouch, that all the black people in the kingdom of Senaara, whether Fungee, or Nuba, are perfectly armed against the bite of either scorpion or viper. They take the cerastes in their hands at all times, put them in their bosoms, and throw them at one another, as children do apples or balls, without having irritated them by this usage so much as to bite. The Arabs have this secret naturally, but from their infancy they acquire an exemption from the mortal consequences attending the bite of these animals, by chewing a certain root and washing themselves, (it is not naming) with an infusion of certain plants, in water. One day when I was sitting with the brother of Sheik Adelsin, prime-minister of Senaara, a slave of his brought in a cerastes, which he had just taken out of a hole, and was using with every sort of familiarity; I told him my suspicion that the teeth had been drawn, but he assured me they were not, as did his master, Kition, who took it from him, wound it round his arm, and, at my desire, ordered the servant to carry it home with me. I took a chicken by the neck and made it flutter before him, his feeming indifference left him, and he bit it with signs of anger, the chicken died almost immediately;—I find his seeming indifference, for I constantly observed that however lively the viper was before, yet, upon being feized by any of these barbarians, he seemed as if taken with fickness and feebleness, frequently flutt his eyes, and never turned his mouth towards the arm of the person who held him. I asked Kition how they came to be exempted from this mischiefs? He said they were born so, and so paid the grave and respectable men among them. Many of the lighter and lower sort talked of enchantments by words and by writing, but they all knew how to prepare any poison by medicines, which were decoctions of herbs and roots. I have seen many thus armed for a reason, do pretty much the same feats as those who possefs the exemption naturally; the drugs were given me, and I several times armed myself, as I thought, resolute to try the experiment; but my heart always failed me when I came to the trial; because, among those wretched people, it was a pretence that they might very probably have sheltered themselves under that I was a Christian, and that it had no effect upon me. I have still remaining by me a small quantity of this root, but never had an opportunity of trying the experiment."

Among the writers of antiquity we find abundant mention of the Pithili, or serpent-east; men who pretended to possess the inherent power of charming serpents, and de-ouering them without danger. Lucan speaks of the practice of the Pithili, or African tribes, and informs us they were employed by Cato to attend his expedition through the Lybian deserts, for the recovery of his soldiers bitten by serpents. Strabo tells us the Pithili, or men of Crene, possefs a secret antidote against the poison of those reptiles. It appears equally certain that there are tribes of men in the East, who, to this day practice the same arts. Savary relates that when at Rofetta, he was present at the festival of Sidi Ibrahim, in which the rear of a procession composed of the different tribes, and chiefs, or priests of the country, bearing the standard of Mahomet, was brought up by a troop of these modern Pithili. These men, says Savary appeared frantic, with naked arms, their eyes wild, and enormous serpents in their hands, which twined round their bodies and endeavoured to escape. They feized the serpents forcibly by the neck, avoided their bite, and, regardless of their bites, tore them with their teeth and eat them alive, while the blood flowed from their defiled mouths; other Pithili struggled with them to free away their prey, for the contention was who should devour a living serpent!—The astonished populace followed, and cried—a miracle!

The remarks of Sonnini, one of the last writers on this subject, may not prove uninteresting in conclusion. "The East," says he, was at all times the country of magicians, men boasting to have the power of charming serpents, of braving their bite, and their venom, of rendering them docile to their voice; they formerly existed there under the name of Pithili, and there are still to be found, people who pretend
pretend to have inherited their secrets. I knew one of those
vered in this kind of fascination; he was certainly the most
ignorant, and most foolish of the Greeks; his secret con-
filled chiefly in thirteen words, which it was necessary to
pronounce in fight of the serpents. He told me also, that, in
order to guard against the bite of these reptiles, it was
necessary to try to take one alive with the precaution of
feizing it strongly by the neck so as to prevent it from biting,
and not to concern myself about the body and tail,
the twirlings of which lightly squeeze the arm. You
must then flip round its neck a running knot made with
coarse thread, and draw it tight by degrees till the
animal is strangled. When it is on the point of dying,
you open it and take out its fat, with which you rub
your hands; then put my modern Pyllius to me, you
have nothing more to fear from the bite of every species
of serpent."

The figure of ceraflas, occurs frequently among the
hieroglyphic characters inferred upon remains of Egyptian
antiquity.

Nasicornis. Somewhat oblivious yellowish, va-
rigated with black; flexuous, lateral band pale, and two
horns on the front. Coluber nasicornis, horn-noc

This remarkable snake was first described by Dr. Shaw in
the Naturalist's Miscellany. The most striking peculiarity of
his species are the two large sharp pointed horns, situated
on the top of the nose, or anterior part of the upper jaw.
These horns stand nearly upright, but incline slightly back-
wards, and a little outwards on each side, and are of a fab-
flane somewhat flexible; their shape is rather triangular.
The length of those horns is about half an inch, and at the
base of each stands an upright strong scale, of nearly the
same shape with the horn itself, and thus giving the ap-
pearance of a much smaller pair of horns. The mouth is fur-
nished with extremely large and long fangs, or poisonous
teeth, two of which appear on each side of the mouth; the
hinder pair being smaller. The length of this animal is about
thirty-five inches. Its colour is yellowish, olive-brown,
very thickly sprinkled all over with minute blackish specks.
Along the whole length of the back, extends a series of yellowish-brown oblong spots, or marks, each of which is
imbedded in a patch of black; and on each side of the body
from head to tail runs an acutely flexuous, or zig-zag line,
or narrow band of an ochre colour, which is bounded be-
neath by a much deeper or blacker shade, than on the re-
mainder of the body. The belly is a dull ochre colour or cinctures
yellow, flecked with blackish spots and markings, and
besides these a number of black spots of various sizes are
sparsely dispersed over the whole animal; the tail is some-
what thin and short in proportion to the body. The scales
are hard, stiff and strongly carinated, the head is covered
with small scales, and is marked on the upper-part by a
longitudinal patch of brown, running out into pointed pro-
ceffes at the sides, and bounded by a space of dull lead
colour or cinctures. The shape of the head is broad and
flattened, the checks varied with black and yellow marks.
The horned snake is supposed to be a native of the interior
parts of Africa. The specimens above described, was ob-
tained from the matter of a Guinea vessel by the Rev.
Edward Charles Jenkins of Charleston in South Caro-
olina.

Aspis. Nofe terminated by an erect wart; body rufous,
with alternate, roundish, dulky, distinct, and confluent spots;
beneath fleec blue dotted with yellow. Coluber apsis,
abdominal scuta 146, subcaudal scales 46. Gmel. 146—34,
p. 106. n. 219.

Considered by some as a variety of coluber berus; it is a
native of Dauphiny, Lyons, and Poitiers. Cepede de-
scribes a snake that inhabits the northern parts of France
under the name of L'Afpe, but which, according to La-
treille, is not the true coluber alpis of Linneus, as its
name may imply. This kind, Cepede informs us, is about three
feet in length, of which the tail measures three inches
and eight lines. The head is rather large, and covered
with small carinated scales, the body larger, of similar
structure, the colour, pale rufous grey, and along the upper parts
are three longitudinal ranges, of roundish dark rufous spots,
bordered with black, and which unite or become confluent
near the tail, and thus exhibits the appearance of a zig-zag
band, similar to that of the common viper. The under-
parts of this snake, are of a dulky colour, marbled with dull
yellow; its fangs resembfe those of the common viper, and
it is reputed equally poisonous with that species. We in-
troduce this snake under the species alpis, conceiving it may
be hereafter ascertained to be of the same individual species,
although writers are not agreed on this point at pre-
sent.

Ammodotes. Brown or pale blueish, with a dentated
black dorsal band; nofe terminated by an erect wart.
Coluber ammodotes, abdominal scuta 142 21, subcaudal scales

Inhabits the Ealf, and mountainous parts of Illyria.
This species is greatly allied to the vipers, from which it is
distinguished principally by the erect process at the tip of
the nout. The colour is usually blueish grey or brown,
with a continued black dorsal band, refembling that of the
viper. This is considered as an extremely poisonous species,
and according to Matthioli, proves fatal in the space of
three hours. The flesh is used medically for the fame
purposes, as that of the common viper.

Lachesis. Yellowish-grey, variegated with brown; a
black transverse band above the eyes.—Cobra lachesis,

Described and figured by Seba, from whom it appears
this species is a native of Ceylon, and is known by the name of
bith. Its colour is a rich and somewhat irregular varia-
tion of deep and light brown, disposed in streaks and
patches, on a yellowish grey ground. The scales, which in
many parts are tipped with white, are large, strongly
carinated, and fixed only at the base, while the remainder
is loose or free. This singular disposition of the scales,
affords the animal an opportunity of elevating or depre-
ing them at pleasure, and in moving, is said to occasion a kind
of ruffling noise.

This is a poisonous species, being armed with large fangs,
and from its general form, appears to be an animal of consider-
able strength. The head is indistinct, or not distinguished from
the rest, by any contraction, or appearance at the neck.
The male is deeper coloured than the female, and seems to
have the body larger, and the tail more fender. The general
length of this snake, seems to be about four or five feet, and
the tail short in proportion to the body.

Clotho. Greyish-orange; variegated with numerous
waved black bands; keel of the fcares on the chin with a
white spot; tail very fender.—Cobra clotho, Laur. Amph.
Vipera, Bith. Cernhina eleganteviffina.

Inhabits Ceylon and Cuba, and is supposed to be a poi-
Noon species. This appears to be from the work of Seba
to be a large snake, measuring more than six feet in length,
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and being thick in proportion; the head large, covered with minute scales, and as in the coluber laheles, scarce distinguehed from the body, by any perceptible contraction at the neck. The colour of the upper parts, is greyish orange flecked with black specks, and marked with transverse undulate, or somewhat zigzag bars of black. The under parts are ciferous, variegated with a few black bars, and transverse stripes.


The length of this species is about sixteen inches; the head large, marked with four or five definite spots, and covered with small scales; the body rather bulky; the tail is short, measuring about a ninth part of the whole length. It is a native of America, and is considered as an extremely poisonous animal.


This, according to Cathey, is the size of the black American viper, measuring about two feet in length, and being large in proportion; he tells us it is a flagellis reptile, advancing deliberately even to escape danger, but will yet defend itself when attacked with much fierce ness, and its bite is said to be very venomous. It is found in Virginia, and Carolina, in the half of which it is called the trueman snake. This species preys on lizards, and other animals.

M E G A C R A. Brown, varied with yellow: head flat and heart-shaped, and a large orifice between the eyes and nostrils on each side. La Vipere Fer de Lance, Cepede.

This is a large species measuring five or six feet in length. It inhabits the island of Martinico, and some of the neighboring islands, and is considered one of the most formidable of the serpent tribe. A specimen of this snake, preserved in the British Museum, is a rich deep brown, with yellow variegations, the back being marked throughout the whole length, by pretty numerous equidistant, broken, and slightly alternating bars of dull yellow, which, defending and joining at intervals with the neighbouring ones, form either numerous and somewhat irregular markings of similar colours along the sides, with still more obscure crofflings on the part nearest the scutes, intermixed with smaller patches and spots: the abdomen is dull yellow, clouded and flecked on the sides with pale brown. The head is large, flat, heart-shaped, and covered with very small carinated scales; but the terminal scale of the nose, and those at the sides of the mouth, are very large, and above each eye is also a very large scale. The nostrils are small, and between them and the eyes on each side is a large orifice, which has been regarded as a passage to the organ of hearing; the scales on the whole upper parts of the body are moderately large, ovate, and carinated, the back slightly elevated, the sides rather flapping, and the abdomen flattish.

The fangs of this serpent are of a large size, about three quarters of an inch in length, and curved. The poison is said to resemble that of most serpents, being a clear yellowish fluid, like olive oil. The symptoms are alike as follows: from that of the viper, but it is a much stronger degree. When preparing to bite, it is said to throw itself into a spiral form, and to spring with great rapidity on its prey, but at other times to be rather slow in its motions, and of a torpid nature, concealing itself beneath the herbage, or within the hollows of trees. It frequents forest plantations, for the sake of the rats, which abound in such situations, and also preys on birds. The female goes for six months with young, and produces the new brood perfectly formed, and amounting to forty, fifty, or even sixty; they are observed to vary in colour when young, some being yellow, others grey, and others intermixed, yellow, grey, and brown.

C O R E L L A. Brown, mixed with white: head broad with a head coloured stripe behind each eye. Coluber colberti, abdominal scuta 150, subcaudal lquamae 22. Linnaeus.

Grows to the length of two feet nine inches, and varies much in the disposition of its colours, and the number of its abdominal scuta, and subcaudal scales. Gmelin enumerates no less than fourteen variations of this kind. It is a very common snake in America.


Refembles C. coronatus, and like that species, inhabits New Spain.


Inhabits most parts of Europe, where it frequents woods, moitl hedges, and shady places. Many varieties of this snake are described by writers, but the colour is in general either a bluish grey, or pale olive above, the sides variegated with black, and the under parts a mixture of black and white. The head is rather small comparatively, and is covered with large yellowish plates; the tail is of moderate length, and gradually tapers to the extremity.

This snake preys on frogs, mice, and small birds, insects, and worms; and occasionally frequents the water in search of the fish; it is capable of swimming, but not well. It deposits its eggs in any warm and moist situation in the form of a continued chain or necklace of ova, to the number of twelve, fourteen, sixteen, or even twenty, of the size of those of a blackbird, and of a white or yellow colour, and it appears hatched in the spring following. During the winter the snake conceals itself and becomes nearly torpid, and reappears in the spring, at which season it is said to cast its skin; we suspect that it calls its skin twice every year. This is not a poisonous species.

A T R O V I R E S. Black green speckled with yellow; abdomen yellow, with a row of black specks down each side. Anguis capulpho niger, Aldr. Serp. La Coluber vertu et jaune, La Cepede.

A species sometimes confounded with the preceding; it is described with accuracy by La Cepede, who informs us it is frequent in some provinces in France. Its haunts are woods, and moist shady places; in size and general appearance it resembles the ringed snake, coluber nitris, but differs in colour, being of an extremely dark or blackish green, appearing at the first view entirely black; the sides are marked with numerous rays of yellow specks, of different forms, some oblong, and some square; the eyes and edges of the mouth are bordered with yellow scales; the abdomen is also yellow, every plate being marked on each side with a black
but the snake, which he supposes to have been of this species, and which had been so completely tamed by a lady as to come to her whenever she called it; follow her in her walks, wave itself round her arms, and sleep in her bosom. One day, when this lady went in a boat to some distance up a large river, she threw the snake into the water; imagining that it would readily recover the boat by swimming; but the current proved unusually strong at that juncture owing to the advance of the tide; the poor animal in spite of all his efforts to reach the vessel was unfortunately drowned.

Gronovianus. Bleugh-ah, beneath blackish; a white arched spot each side the hind head, and one black: back-waved with black. Gmel. Laur. Amph. Bears a near affinity to the preceding, and is perhaps a variety only of the former, coluber matrix. Number of plates and scales not ascertained.

HUMANUS. Black spotted with white; tail alternately striped with black and white. Coluber humanus. Gmel. Nutrix humanum. Laur. Amph. A snake very commonly domesticated in New Spain; and also said to inhabit Amboyna.


Tyrolinea. Abdominal scuta 178, subcaudal scales 60. Gmel. Described after Scopoli, who informs us it inhabits the Tyrolean country, and deposits its eggs among flowers; these are white and leathery, with a lateral yok and turbid watery white, and are found sticking together in clusters of about fourteen in number.

Bipes. Abdominal scuta 116, subcaudal scales 58. Gmel. Scop. ann. hist. Mentioned by Scopoli as an inhabitant of the Tyrolean waters. This kind preys on fish and frogs; and is said to be furnished with two short procured or feet; the eyes are red or rny, lower jaw whites, dorsal scales elliptic and marginal; sides spotted with white; plates of the belly thick, with a brown spot in the middle.

Austriacus. Bluish-grey, with a double dorsal row of rufous spots, and reddish sides and abdomen. Coronella austriaca. Laurenti. La Lisse, Cepede. This bears a general resemblance to the common snake, coluber matrix, and seems to have been first described by Laurenti, who speaks of its being common round Vienna: it occurs also in France, and several other parts of Europe. The principal distinction between this species and the coluber matrix consists in the perfect smoothness of its scales, those of the matrix being somewhat carinated. This animal inhabits moist meadows, hedges, and swampy places, and bites with much eagerness, but is incapable of doing any injury, as nature has not provided it with poisonous fangs. It is said to be easily tamed, in which state it shows a considerable degree of attachment.


Length from eighteen inches to two feet; the colour pale whitish, with a more obscure cast on the back, and is marked throughout with nearly equidistant black bands, each surrounding the body, and divided half way up from the abdomen by a line or narrow stripe of the ground colour; thus giving a banded appearance to the lower part of each band. The head is covered with large scales, and marked on the fore part by a transverse black bar running across the eyes. This is a native of South America, and is said also to inhabit some parts of Asia.


The coluber naja is a native of India and the Ternate islands, where it appears to be one of the most common, as well as most noxious, of the serpent tribe; very frequently proving fatal in the space of a few minutes to those who unfortunately experience its bite. The form of this species is very remarkable: its general length seems to be three or four feet, and the diameter of the body about an inch or a quarter. The head is comparatively rather small, and is covered on the fore part with large smooth scales, as in the greater number of innoxious serpents; the scales on the back part and sides of the head, and also on the neck are smaller and ovate: those on the remainder of the animal, on the upper part oblong oval, not ill resembling the general form of a grain of rice. At a small distance beyond the head is a lateral swelling or dilation of the skin, which is continued to the dilation of about four inches downwards, where the outline gradually sinks into the cylindrical form of the rest of the body. This part is extensible at the pleasure of the animal; and when viewed from above, while in its most extended state, is of a somewhat cordate form, or wider at the upper than the lower part, and is marked with a fingular spectacle-formed spot of black and white, the mark itself being white, and the edges black, and the middle of each of the rounded parts black. This mark is more or less distinct in different individuals, and also varies occasionally in size and form, or in some individuals is altogether wanting.

The usual colour of the animal is a pale ferruginous brown above; the under parts bluish-white, sometimes slightly tinged with pale brown, or yellow; the tail, which is of a moderate length, tapers gradually and terminates in a slender, sharp pointed extremity. The title of cobra de capella, or hooded snake, has been given to this formidable reptile by the Portuguese, from the appearance which it presents when viewed in front in an irritated state, or when preparing to bite, at which time it bends the head rather downwards, and seems hooded, as it were, in some degree by the expanded skin of the neck.

Laurenti enumerates four varieties of this hooded snake, Naja tarenten, the common kind; f' Naja saucinata saucinatis per tonum corsus ex furo bruis, having tucatrous red bands over the whole body; j' Naja samoens, ex cinerea grisea, fumo dono rufa. Cinerous, with the back rufous; and j' Naja macula bia, ex furo rufa, spumis fuscis alba macula notatis; of a tawny yellow colour, and having every scale marked with a single white spot. But it appears from the work of Dr. Ruffell "On the Serpents of India," that there are many other varieties of this extraordinary snake. He describes no less than ten different kinds that are found in India alone, and seems to intimate that those are not the whole of the Nagoo tribe which infet that part of the world. It is possible, on further investigation, some of these described by Dr. Ruffell may prove to be intricately different: according to the character laid down by him, the number of the abdominal plates and scales on the belly, they are closely fo; but it is not on this criterion, the tally of which is too apparent, that we hazard an opinion; we adhere to the different conformation of the spectacle-like mark.
mark on the back of the neck, and still more to the di-

mearliness observable in the figure of the scuta and lamina; the variations in colour are but secondary particulars in con-

sideration. Dr. Raffell enumerates the varieties above-men-

tioned in the following order.

1. Aregua nago. With a pale central spot in the middle of each of the black spots of the spectacle-shaped mark. 
Abdominal scuta 180, subcoidal scales 60.

2. Coddum nago. This variety is darker than the other; and the skin is of a yellowish cast; but the principal limi-
tation is in the spectacle-mark, which consists of an oblong curved frame without the usual black eyes or centre-spots of the others. Abdominal scuta 187, subcoidal scales 57.

3. Sunko nago. The chief distinction of this is a plain hood, without any mark. This variety is supped by Seba to be the female of the species; but Dr. Raffell in-
forms us that one which he brought home from India, and pre-
cented to Mr. John Hunter was a male, and that the usual spectacle-mark is found indifferently both on the males and females. This variety is more rare than the reft. 
Abdominal scuta 185, subcoidal scales 56.

4. Mulla nago. The cervical scuta in this variety are spotted here and there with faint greyish spots, and four of the middle ones are entirely of a blueish-grey. 
Abdominal scuta 182, subcoidal scales 63.

5. Malle nago. The colour of this variety is of a lighter brown than the rest, and the scuta whiter; and, without spots, but seven of the pectoral ones are completely dark. 
Abdominal scuta 191, subcoidal scales 62.

6. Cunto nago. In this some deviations were observ-
able in the laminae; all the cervical scuta were dusky, and the trunk had a strong blueish cast. 
Abdominal scuta 186, subcoidal squamae 60.

7. Jenna nago. The skin of the hood in this is tinged with orange colour; the scuta of the neck spotted with 
grey, and fix of the lower ones wholly of a blue grey. 
Abdominal scuta 189, subcoidal squamae 57.

8. Nella tow pam. With the black on the hood uninfus-
dy deep, and all the jugular scuta remarkably dusky. 
Abdominal scuta 180, subcoidal squamae 62.

9. Kifna nago. The middle lamina of the three between 
the eyes remarkably broad, and the posterior part subovate 
instead of semi-cordate; five of the jugular scuta dusky, and fix of the pectoral almost black. 
Abdominal scuta 180, sub-
coidal squamae 63.

10. Korie nago. The three laminae between the eyes 
remarkably narrow; the large posterior part oval; colour of 
the trunk, and still more of the scuta unifundus blue. 
Abdominal scuta 184, subcoidal squamae 57.

The cobra de capello, it is observed, is everywhere exhibited 
publicly as a show in India; and is of course more universally 
known in that country than almost any other race of reptiles. 
It is carried about in a covered basket, and so managed by its 
proprietors as to assume, when exhibited, a kind of danc-
ing motion; raising itself upon its lower part, and alter-
nately moving its head and body from side to side for some 
minutes, to the sound of some musical instrument which is 
played during the time. The Indian jugglers, who thus exhibit 
the animal, first deprive it of its fangs, which renders it in-
capable of inflicting a poisonous wound by means of its bite.

Dr. Raffell, in his account of various experiments made in 
India with this serpent, affirms us that as a general standard 
for a comparison of the effects of its bite with that of other 
poisonous serpents, he never knew it prove mortal to a dog in 
less than twenty minutes, and to a chicken in less than half a minute. 
Thus fatal as it is, its poison seems not so speedy in opera-
tion as that of the rattle-snake, which has been known to 
kill a dog in the space of two minutes. The following in-
teresting experiments are related by Dr. Raffell to confirm 
the accuracy of this observation.

In the month of June 1787, a dog bitten by a Cobra de 
capello on the inside of the thigh, howled at first, as if in 
severe pain; after two or three minutes he lay down, con-
tinuing to howl and moan; after twenty minutes he re-fused, 
but with much difficulty, being unable to walk, and his 
whole frame appeared greatly distressed. He soon lay 
down again, and in a few minutes was seized with convul-
sions, in which he expired twenty-seven minutes after. 
This is the only instance mentioned in which the poisonous bite of the Cobra de capello proved fatal to dogs in much less 
than the space of an hour. — A large and very stout dog was 
bitten by another Cobra de capello on the inside of the thigh, which in a minute or two was drawn up, the first symptom in general of the poison having taken effect. He continued, 
however, nearly half an hour longer walking on the three re-
main ing legs, seeming not otherwise disordered; but after 
this time, he laid himself along in great inquietude, his head 
and throat being convulsed in an uncommon degree; he 
made several vain efforts to rise, his legs became both para-
lytic, and after continuing in this state for an hour, he ex-
pired. — A large dog was bitten by a Cobra de capello which 
had been captive only two days. He complained a 
good deal at the instant of the bite, and the leg was soon drawn up. In twenty-five minutes he was feebly convulsed, 
succeeded by fever, in which state he lay for ten minutes; 
the convulsions, however, returned, and he expired in a 
quarter of an hour, being fifty-six minutes after the bite. 
This experiment was tried on the 11th of November.

August 9th, a Cobra de capello, which had lost two of 
his longest fangs, but retained two of the second order, was 
made to bite a very large stout dog. At first the dog com-
plained loudly, though without drawing up the thigh, or 
swelling any other symptom of poison; but happening at 
this time to break loose, he was pursued, and brought back, 
after a chase of an hour and a half, much fatigued and 
heated. After reeling a quarter of an hour, water was 
ofered to him, which he refused, though he eat some mor-
sefs of bread thrown into it. About a quarter of an hour 
afterwards he became much dilated, grew entirely out-
rageous, howling violently, snapping at and gnawing the 
flake to which he was tied with incredible ferocity. This 
continued about three hours, when growing faint, his how-
lings grew weaker, his convulsions increased, and he expired 
about four hours after the bite. — A pig bitten by a snake 
of this kind, which had been fed only once in seven 
days with milk, became greatly disordered in twenty minutes, and expired in less than an hour. — A chicken has been some-
times known to survive two hours after being bitten by a 
Cobra de capello. Chickens and pigeons bitten by a Cobra 
de capello, whose fangs had been eradicated, suffered no 
symptoms of poison; but when poison taken from the same 
snake was infused into their bodies, either by incision or pun-
chure, they suffered the usual symptoms, and very often 
died.

It was endeavoured also to ascertain the effects of the bite 
of the Cobra de capello upon reptiles of the same freecies, 
the result of which appears doubtful. In some instances, 
the bitten animal experienced no kind of injury, while to 
others the bite proved fatal. An attempt was made, on the 
17th of August 1788, to make a Cobra de capello bite an-
other (of the variety called Naja paragallo) in the tail, but 
that part being found too small, the body was bitten, a little 
above the vent. The bitten snake soon left its former 
activity,
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difficulty and when put under a glass coiled itself up. In this state it was left, and after an hour and a quarter was found dead. On opening the belly, the parts immediately beneath the bite appeared much inflamed, though it could not be discovered whether any fangs had penetrated into the cavity.

A Cobra de capello, received by Dr. Ruffell from Ganjam, under the name of Saltana, was made to bite another remarkably large Cobra brought from the same place, under the name of Coultish. The poison was tied on the place, but no marks of fangs could be perceived, and the Coultish remained as well as before: this experiment was repeated with the same result, though a little blood as well as poison was found on the part bitten. Some days after this, a Cobra de capello (of the variety called Coudalum naga) was made to bite the Coultish on the belly; both fangs visibly acted; blood appeared on the wound, but no other consequence followed. A Tar tuta snake, bitten immediately after, in the same manner, died within two hours.

Rufus. Rufus, with dilatant reddish-fuscous bands; spectacle-spot somewhat heart-shaped, and marked with four black spots. Seba. Naja brasilienensis, Laurenti. La Cepede, &c.

Described by Seba and others also by him as a native of Brafil. This is perhaps a variety of the preceding.


According to Seba, this species is a native of Ceylon; he considers it as a kind of Cobra de capello, or hooded snake, in which respect it is mistaken. The length of this snake is between four and five feet; the head is extremely large, depressed, cordated behind, somewhat compressed at the sides of the mouth, and covered above by very large fleshy pates. At some distance from the eyes are two remarkable, oblong, brown spots. The neck is thin, and, together with the whole body, extremely compressed on the sides; tail long, round, and tapering to a fine point. From the head, along the back, runs a row of large, broad, hexagonal scales, those on the other parts are ovate; the abdominal plates are very narrow. The general colour of the animal is rufous-brown, with moderately distant, broadish, transverse, pale bands, each of which, at its juncture with the scuta, is marked with a white spot.


The abdominal plates, according to Dr. Ruffell, amount, in this species, to 168, and the scales under the tail to 59. The length of this snake is about four feet. Its colour an elegant pale yellowish-brown, marked throughout the whole length of the back with a continued series of large ovate spots of a deep brown colour, pailet in the centre, and surrounded by a narrow line of white. In some parts those spots are nearly confluent; on each side of the body is a row of brown oval spots, smaller than those on the back; and besides these, a few still smaller transverse marks are sparingly scattered on the sides; the under part of the body is white, with a few dully spots; the head is rather large, the front obtuse, the mouth wide, the fangs large, and, in several other poisonous serpents, double, a smaller fang being situated close to the larger one on each side.

Dr. Ruffell informs us, this species is scarce less common in India than the Cobra de capello; but from its not being carried about, like that and some other snakes, as a public show, is not at universally known either among the natives or Europeans.

Several experiments were made by Dr. Ruffell to determine the effects of its bite, from which it appears to be one of the most poisonous of its tribe. A chicken bitten in the pinion by one of these snakes, which had been caught two or three days before, and seemed in high spirits, was infantly infected, feigned with convulsions, and expired in thirty-eight seconds. Immediately after the chicken, a fowl dog was bitten in the thigh; within less than five minutes he appeared stupified; the thigh was drawn up, and he frequently moved as if in pain. He remained, however, standing, and ate some bread that was offered to him. In about ten minutes the thigh became paralytic; in fifteen minutes he entirely lost the use of the wounded thigh, and lay down, howling in a dismal manner, frequently licking the wound, and making, at intervals, ineffectual attempts to rise. In nineteen minutes, after a short convulsion, he again began to howl, mounted often, his breathing became laborious, and the jaws were completely shut. The few succeeding minutes were passed alternately in agony and flupor, and in twenty-five minutes after the bite he expired. A second dog, of much smaller size, was next bitten, and expired in the space of six hours. After this, a rabbit was exposed to the bite of the snake, and died in less than an hour; and, lastly, a chicken bitten in the pinion expired in less than six minutes. The whole of the above experiments were made with the same snake in the course of the same morning.


The length of this kind is about thirty inches. The head is rather large in proportion, and obliquely tapering, but not pointed, and is covered entirely with very small scales; the colour is as above described. This is a native of India, and was first described by Dr. Ruffell; it is of the poisonous kinds, and has the fangs remarkably long and slender. From the experiments of the last-mentioned writer it appears, that a chicken died, after having suffered strong convulsions, and afterwards flupor, in about eight minutes from the bite; pigs and dogs were feigned with a flupor, convulsions, &c., but in a few hours recovered from the effect of the poison.

Crotaulus. Cinereous, marked above with large alternate blackish spots; beneath yellow, flecked with brown. Coluber crotalus, abdominal scuta 154, subcaudal scales 43: Linn.

A large species, with the habit of the rattle-snake; the head is heart-shaped, the eyes lids protuberant, fakes carinated. Native country unknown.

Severus. Cinereous, with oblique linear whitish bands, edged with brown. Coluber severus, abdominal scuta 170, subcaudal scales 42. Linn.

Length about seventeen inches; thicknes moderate; head broad, obtuse, livid, with cinereous band between the eyes, and behind the nose; eyes large; neck thick; the colour of the upper parts as before described; the abdomen dull; sides speckled with white; tail short. The figure in Seba, quoted by Linnzeus, is of a pale rufous colour, with whitish bands, somewhat resembling Hebrew characters in form, and edged with brown; the abdomen pale yellow, with a row of blackish spots on each side.

Porphyraeus. Violet-black, with the abdomen and sides crinom, the scuta margined with black. Zool. New Holl. p. 27. pl. 10. Abdominal scuta 188, anal scuta 73, subcaudal scales 45.

First described by Dr. Shaw, who speaks of it as a moderately large and beautiful species; the general proportions nearly
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neatly the same with those of Coluber natrix, the common English snake. The head is rather small, and covered in front with large scales: the colour of the head and whole under parts very fine deep violet; sides and abdomen crimson, deep blue on the fore-part, the large scales near the vent being carmine-coloured, with black tips; the abdomen rose-coloured, with a tinge of yellow, each scutum deeply edged with black, thus forming a beautiful series of transverse black bars down the abdomen. The tail measures about a sixth part of the whole length, and is furnished beneath, exclusive of the divided subcaudal scales, with about seven scuta, or undivided laminae, commencing immediately beyond the vent, which is edged with familiar smaller squamae; the colour of the under parts of the tail is a blueish-ath. the rose-colour of the abdomen ceasing at the commencement of the tail. In the Zoology of New Holland, Dr. Shaw describes this species as distinct of fangs, and consequently innocuous; an error arising from the mistaken state of the fragment he examined. The snake has been since observed to be furnished with thistle organs; and, as Dr. Shaw remarks, in his General Zoology, to be highly dreaded by the natives of Arrabriba, as a poisonous species.


Seba describes this snake as a native of the East Indies, having received it from Persia and Japan. Its general length is about two feet or more; its colour red, varying to deeper or paler in different individuals, and sometimes inclining to brown; the variegations white or whitish. The head is moderately large, and covered in front with large scales; tail extremely short and tapering to a point. La Cepede considers it a poisonous snake.

Aquatius. Brown, with the abdomen banded with black and yellow. Water viper, Cathey.

We are acquainted with this species only from the account given of it by Cathey. "This serpent (says that writer) is called in Carolina the water rattle-snake; not that it hath a rattle, but is a large snake, and coloured not much unlike the rattle-snake, and the bite said to be as mortal. This snake frequents the water, and is never seen at any great distance from it. The back and head are brown, the belly transversely marked with black and yellow alternately, as are the sides of the neck; the neck is small; the head large, and armed with the like destructive weapons as the rattlesnake; it is very nimble, and particularly dexterous in catching fish. In summer great numbers are seen lying on the branches of trees hanging over rivers, from which, at the approach of a boat, they drop down into the water, and often into the boat on the men's heads. They lie in this manner to surprice either birds or fish, after which they plunge, and pursue them with great swiftness, and catch some of a large size, which they carry on shore and swallow whole. One of these I surprized swimming averse with a large catfish in his mouth. The tail is small towards the end, and terminates in a blunt horny point, about half an inch in length, and which, though harmless, is considered as of dreadful efficacy, by the credulous vulgar, who believe that the animal is able with this weapon, not only to kill men and other animals, but even to destroy a tree by wounding it with it; the tree withering, turning black, and dying."

Lacteus. Milky-white, the back marked by double black spots; head black, with a longitudinal white line. Coluber lacteus, abdominal scuta 203; subcaudal scales 32. Linna.

Length eighteen inches. A native of India and South America, and is reputed poisonous.


Melanis. Deep black; sides clouded with bluish, the eye brown, with the edge of the pupil silver. Coluber melanis, abdominal scuta 148, subcaudal scales 27. Gmel. Pallas.

Observed by Dr. Pallas on the borders of the Volga and Samara rivers in Siberia. It has the general appearance of the viper, but differs in colour, being of a deep black on the back, and of a yellowish beneath, marked with patches of a deeper call, while the sides are clouded, and spotted at intervals with bluish. The eyes are of a bright white, with perpendicular pupils, and ferruginous irides; tail short, and gradually tapering to the tip.

Buccatus. Whitish, with large double brown dorsal spots; head somewhat depreved, checks timid. Coluber buccatus, abdominal scuta 167, subcaudal scales 72. Linna. A poisonous species; it inhabits South America and India. Length twelve inches.

Atrox. Grey brown, with transverse linear whitish figures; abdomen dulky with white transverse variegations. Coluber atrox, abdominal scuta 150, subcaudal scales 67. Linna. Length about eighteen inches: it is a poisonous snake, and is a native of the island of Ceylon.

Coralinus. Glaucous, with scales somewhat heart-shaped, and three brown lines down the back. Coluber coralinus, abdominal scuta 159, subcaudal scales 82. Linna. Linnaeus describes this as a poisonous species; it is a native of the eastern regions; it preys on birds.

Liberis. Pale; head white; body marked above with linear black bands. Coluber Libera, abdominal scuta 110, subcaudal scales 50. Linna. Described by Kalm, who informs us that it is a native of Canada, and that the upper parts are traversed by linear black bands; the head white with two rusious spots on the top, and a triangular spot over the nose. Linnaeus mentions it as a poisonous species, a particular considered doubtful by Dr. Gray.

Aulicus. Grey brown, with transverse white bands bifurcating over the sides. Coluber aulicus, abdominal scuta 184, subcaudal scales 60. Linna. The length of this species is six inches; it inhabits America, and is one of the poisonous kind of snakes.


This is a beautiful species, measuring in length about two feet; the colour is white, marked down the upper part with a quintuple series of black spots with red centres; the middle row is composed of very small spots, the next on each side with larger ocellated ones, and the lowest on each side, next the scuta, resembling that on the middle of the back, and consisting of small pocks; the head is marked by a crooked-furred spot on the top, and by a few blackish ones across the frown; the tail is short, measuring two inches and a half in length, and tapering to a point.

Rhombeatus. Glaucous, with blackish lozenge-shaped spots, blue in the middle. Coluber rhombeatus, abdominal scuta 157, subcaudal scales 70. Linna. Length from two to three feet; colour, in general, grey, sometimes brownish, with three alternating rows of ovoid dulky spots, with large blue centres; the abdomen is pale or whitish, and often clouded with blueish grey. This is a native of India and South America.

Javanicus.
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MELANURUS. Yellowish brown, with black head, and two black spots on the tail. Ruffell. Ind. Serp.

A small species about ten or eleven inches in length, scarcely of the thickness of a goose quill, and nearly of equal diameter from the head to the tip of the tail. The colour is a light yellowish brown, with a dotted black line running from head to tail along the middle of the back, and a few fainter fillets on the sides; the head is small, ovate, black, and covered with large scales; the tail short, scarcely measuring more than an inch in length, and is marked at its origin on the upper part, by a large rhomboidal black spot edged with white; and having a white speck in the middle; the tip of the tail is also marked by a similar black spot; the abdomen is of a pale orange colour, and the under part of the tail white, speckled, and variegated with black. The bite of this species is said to be painful but not poisonous. It is a native of India, and is described among the serpents of that country by Dr. Ruffell.

JARA. Black, with double linear white specks, and yellowish collar and abdomen. Jara potoo, Ruffell, Ind. Serp.

This is one of the new species of serpents described by Dr. Ruffell. It inhabits India. The length is fifteen inches; tail very short and tapering suddenly to a point. The abdominal feuta are 175 in number, and the subcaudal scales 56.

ARNENSI S. Yellowish-brown with narrow blackish transverse bands edged with white, and pale abdomen. Arne feata, Ruff. Ind. Serp.

Inhabits the country of Arnee in the East Indies. The length is about eighteen inches; the colour above yellowish, with moderately distant blackish, or very deep brown, transverse bands which are whitish at the margins; the head is small; tail rather short and tapering to a sharp-pointed tip. Abdominal feuta 169, subcaudal feules 50.

SAGITTATUS. Brown, with whitish fagittated dorso spots edged with black. Tar tutta, Ruff. Ind. Serp.

The length of this snake is two feet; the head is rather large in proportion, round, obtuse, and covered with large scales; neck and body flender, the colour on the upper parts yellowish brown variegated, with a chain of series of somewhat triangular, or fagittated spots; the abdomen is yellowish white, and the feuta is marked by a dusky spot on each side. This is a native of India.

STRIATUS. Greenish black, with spotted white bands, and blueish-white abdomen. Gajso tutta, Ruff. Ind. Serp.

This is much smaller than the last, measuring only fourteen inches: the colour above is greenish black, marked with about twenty transverse bands, each composed of a number of longitudinal abrupt white or yellowish white stripes, and along the sides of the body are interrupted rows of similar stripes; the head is obtuse, and covered with large scales, the abdomen blueish-white. Abdominal feuta 174, subcaudal scales 40.

FASCIOLATUS. Cinerous, with whitish transverse bands and glaucous abdomen. Nooni paragoodos, Ruffell. Ind. Serp.

AGILIS. Banded alternately with white and fuscous, and varied with black dots: head small; tail short. — Coluber agilis, abdominal feuta 184, subcaudal scales 50. Linn. Corallus Agilis, Laur.

A native of Ceylon. The head is small, covered with large scales; body flender and smooth, about a span in length, and covered with small scales; tail short, taper, and terminating rather obtusely.

SIMUS. Blackish, with white transverse bands; nose turned up. Coluber. K. SIMUS.

JAVA NICUS. Grey; head striped with blue; body marked with transverse blue stripes edged with golden. Described by Mr. Warmb in the "Memoirs of the Batavian Society," for the year 1787: This is a large and most beautiful species, and is seen principally in the rice fields; whence it obtains the name of Oular-Sawra, or Rice-field Snake. Those which are found in the higher and more wooded situations arrive at a far superior size. The head of this snake is large and flat, and is covered, as in the major part of the coluber genus, with large leathery plates; the mouth is furnished with double rows of sharp teeth, but is deficient of fangs, the animal not being of a poisonous nature; the iris is yellow; upper part of the head grey, mixed with blue; from behind the eyes pass two blue stripes to the upper part of the neck, where they unite into an arch about an inch beyond the head; a third stripe of the same colour proceeds from the snout to the occiput, where it divides into two, and surrounds a yellow spot marked with a few blue specks; the upper part of the body is divided into a kind of lattice-work, formed by stripes of bright blue with gold-coloured edges; the middle parts of the square being of a grey colour, with changeable reflections of yellow, blue, and green; towards the sides the grey colour is of a lighter or paler cast, as well as on the tail, where the squares are smaller than on the back; each side of the body is also marked by a row of white spots, situated at the crotchings of the blue stripes. This snake preys on birds, rats, and various other small animals.


A new species described by Dr. Ruffell. The length of the specimen, examined by that writer, was about two feet and a half; but it is supposed to attain to a much larger size. It was short and thick with moderately large oblong-ovate head, covered with large scales; and the tail short and sharp pointed. The colour of the upper parts very pale or whitish brown, variegated on the back and sides, with large and small irregularly formed, deep-brown patches, and spots, those on the sides being mottly ocellated. The body is covered with very small scales, the three rows next the abdomen being much larger than the rest; abdomen white, the feuta being remarkably narrow or short, and reddish at the margins. The under part of the tail is variegated with black and white.

This is a native of India, and is represented as an animal of great strength, wreathing round the arm, if held for a short time, so closely as to numb the hand; it is not poisonous, its bite producing no other effect than that of temporary pain.

The serpent mentioned by Dr. Ruffell, under the name of Dera, is considered as a variety of coluber boformis, and so also is the Poddla poda, t. 23, 24. The fire is much larger than the serpent above described; the disposition of the scales and colours are the same, but the ground colour is white, and the tail is furnished beneath with several undivided lamellae towards the tip, or after those immediately succeeding the vent, while the tip itself is again terminated by a few divided scales. This snake is found at Calcutta, where it is pretended the bite is very soon followed by eruptions on different parts of the body, though it does not prove fatal in less than ten or twelve days, but the whole of this is regarded as a mere popular error. The other supposed variety, the pedda poda, grows to a very large size, having been seen nine or ten feet in length. In its general appearance it resembles that first described, but the scales are larger in proportion.

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Length eighteen inches; head rather large, and roundish, with the nape flat in front, and turned up into a slightly pointed tip: between the eyes is a black curved band, and on the top of the head a white cruciform mark, with a black central spot; abdomen dusky. A native of Carolina, and other parts of North America.

Pelias. Brownish, with double transverse black bands, beneath green with a yellow lateral band—Coluber pelias, abdominal scuta 187, subcaudal scales 139. Linn.

A native of South America and India. Described by Linnaeus from the Museum of Diggel.

Mucosus. Blueth, beneath pale, with angular head: lips striped transversely with black. Coluber mucosus, abdominal scuta 200, subcaudal scales 140. Linn. 

A native of South America and India. Described by Linnaeus from a specimen in the Muf. Ad. Tr. It is a small species, measuring about eighteen inches in length; the native country is South America.

Cinerexs. Cinerexs; abdomen white; tail reticulated above with brown, and lined transversely beneath. Coluber cinerea, abdominal scuta 200, subcaudal scales 137.

Indies, according to Linnaeus South America and India; it resembles the common snake, and is about two feet in length.

Dipsas. Green with two white stripes. Abdominal scuta 152, subcaudal scales 155. Linn. Serpens furinamentis carules, Seba. inhabits Surinam and other parts of South America.


First described by Lepechin as an inhabitant of the shores of the Caspian sea, where it haunts the low grounds and bully places. It is reported of this species, that when disturbed it first endeavors to escape, but if pursued or irritated, springs forwards on its affblant with great fury, though incapable of doing any injury by its bite. The usual length is about five feet.


A native of Peru; described by Seba, who informs us it is rare in European collections. This is an innoxious species. Linnaeus does not notice this snake, as the number of its abdominal scuta, and subcaudal plates could not be ascertained.

Hygeia. White, with somewhat undulated black zones, and head faciatus longitudinally with black. Ser- pens fumurensis teneoillis, &c. Seba.

A small species of a white colour, barred with numerous irregular black bands, nearly surrounding the body; head small, covered with large scales, and marked by two broad longitudinal stripes uniting at the top of the snout; tail rather short and sharp pointed. Inhabits Siam.


This snake inhabits Africa. In the middle of the head, between the eyes is a large shining shield, composed of many plates; the sides of the head and hind-head is covered with imbricated scales each side; and the snout is sharp.

No less than nine varieties of this snake are described by Gmelin after Laurenti. These we shall enumerate in the Gmelinian order, observing only that on further investigation it is not unlikely some at least of those supposed varieties may prove to be specifically distinct. Those are not noticed by Dr. Shaw, but that writer thinks the C. Petularius of the Muscum Adolphici Friderici, can hardly be considered as a species distinct from Pethola.

E. Coronella Africana, &c. White, with spots on the back; those on the anterior part rounded, and gradually becoming rhomboidal, with the edges reddish. Laur. Amph.

f. Coronella ocellata, &c. Blueth, with a quadruple series of black ocellated spots, which are blue in the middle, and are disposed longitudinally. Laur. Amph.

g. Coronella fuscata, &c. Blueth white with black brown bands, and two longitudinal divided lines. Laur. Amph.


i. Coronella ocellofa, fuscata, &c. With yellowish confluent bands near the belly. Laur. Amph.

j. Coronella ephippium, &c. Brownish white, with very pale brown spots; occipital spots two, and longitudinal; dorsal ones elliptic, and disposed in a single stripe. Laur. Amph.

k. Coronella teniens, &c. Middle of the back marked with a brown stripe; belly and sides whitish brown. Laur. Amph.

l. Coronella anguiformis, &c. With entire circular brown bands, beneath obliquely concurrent.


A native of Africa. The length of this snake is about three feet, of a slender form, and yellowish white with marked throughout the whole length; at equal distances, with triple zones of black or deep brown, which entirely surround the body. The head is rather small, covered with large scales, and marked across the snout by a double zone, of which the smallest division pales across the nostrils, and the largest across the eyes. The whole animal is of a smooth and shining surface.

Lubricus. Flagelliform; white with equidistant black bands; body glossy. Coluber lubricus, Gmel.

Allied to the last species; the body is white, marked with fine black bands; the head is marked across the snout by a black band, and at the top by two oblique stripes nearly meeting at an angle in front; the skin is remarkably smooth and glossy. The length of this snake is eighteen inches. According to Gmelin it is a native of Surinam; the snake described by Seba, as Natrix lubricus, fuscus rubris, and which is considered as a variety of the same species, is a native of Surinam.

Doliatus, milk-white, marked above by large, approximated, suboval black rings. Coluber doliatus, abdominal scuta 154, subcaudal scales 43. Linn.

A small species measuring from eighteen inches to two feet in length; general color milk white, marked throughout by large oval jet-black rings, the ends of which approaching each other on the top of the back, give the appearance of double bars, corresponding with the description given of this snake by Boddaert, Coluber doliatus, annulus nigres per paria digiis. Inhabitats Carolina.

Germanus. Blue, with a black middle-stripe spotted with white, and two lateral white stripes. Le Chapela, 6.
La Cepede. Abdominal scuta 166, subcaudal scales 103.

The length of this beautiful snake is about fifteen or sixteen inches; the colour on the upper parts blue, with three narrow equidistant stripes from head to tail; the two lateral stripes being white, the middle one black, marked by a row of small white specks alternately oblong and round; resembling a small fringe on heads and bodies: the head is covered with large scales, and marked on each side with three or four spots, forming a band across the eyes, the top spotted with pale blue marks bordered with black; the abdomen white. The scuta are each marked at the edge with a small black speck, forming two rows down the abdomen. The native country of this kind is unknown, the species was described by La Cepede from a specimen in the royal cabinet.


This snake measures twenty-five inches in length, of which the tail exceeds six inches. The general colour is rufous; every scale is bordered with yellow, and down the back from the head to the tail run two bright yellow stripes of a golden hue. The scales on the head are large, those on the body smooth. The native country is unknown.

Trilineatus. Rufous, with three black lines. *La trois raie*, La Cepede.

The length is about eighteen inches; the head is covered with large scales; tail about two inches and three quarters long. This is a native of Africa.

Tripectiatus. Body marked with three broad black stripes, the middle one divided by a white line, and three spotted lines down the abdomen. Shaw Gen. Zool.

A small species, measuring a foot in length, and being rather thick in proportion; head rather large, blackish, with the future pale. Described from a specimen in the collection of Dr. William Hunter.

Dione. Pale blue, spotted with brown, and three whitish lines. Pallas It.

This species is a native of the salt deserts towards the Caspian sea, and of the hilly regions near the river Irin; and was first described by Dr. Pallas. It is of a flender form, about two feet in length; the head small, tetragonal and commonly reticulated with blackish futures. The two intermediate spaces between the three lines on the back are marked with a row of dusky alternate spots; and the tail is about one sixth of the whole length.


This snake is in general of a grass-green colour, and is distinguished in particular by the yellow line which extends the whole length of the body on each side of the abdomen. It is of a flender form, measuring about three feet and a half in length, and about half an inch in diameter. The head is moderately large, long, and sharp snouted, the upper jaw extending far beyond the lower. Linnaeus was erroneously led to consider this as a poisonous species, from the fang-like appearance of the large and long teeth in the upper jaw. It is a native of many parts of North America, where it is principally seen on trees, moving with great velocity in pursuit of insects, on which it feeds.

Gmelin describes the natrix flagellii forms of Laurenti, and also the anguis viridis of Catesby, as two varieties of the coluber mycteriian. *Butea Pflugrii* of Dr. Ruifell may be perhaps admitted likewise as a variety. This differs in the colour of the under parts, instead of green being of a cinerous pink colour, elegantly speckled with very numerous minute black and yellowish dots; the margin of the scuta being edged with dull yellow; the skin of the neck also, when the animal is irritated, exhibits by the dilatation of the skin on that part, a beautiful variegation of black and white reticulated marks, which do not appear at other times.

This creature is represented as of a ferocious nature, hissing violently, and snapping at anything opposed to it, but producing no other effect by its bite than that of temporary pain in consequence of mere puncture.

Coluber Nasutus. Serpens viridis, ore acuminato ex Java, officina species, Seba.

Whether this be distinct from the former is uncertain; the head is somewhat larger in proportion, and the body less flender: in other respects it very nearly corresponds. The length is about three feet. This snake according to Seba is a native of Java.

Lineatus. Blue-green, with three or five brown linear stripes, the middle one broadest. *Coluber lineatus*, Linn. *Serpens celedonica lineis subfusis*, Seba.

This snake is a native of India, and is commonly about three feet in length. The general colour is pale blueish green above, with a golden gloss, and is marked throughout the whole length by five longitudinal narrow bands, or stripes of dusky brown or greenish. In young specimens there are rarely more than three stripes. The form of this snake is long and flender, with the head small, the abdomen flatish, and the tail long and thin.


Resembles lineatus, but is smaller; the general colour white tinged with blue, and marked by three longitudinal stripes of black or deep brown, of which that in the middle is broadest. This appears to vary in colour, that described by Seba being whitish instead of white. The abdominal scuta are 163 in number, the subcaudal scales 77. This kind inhabits Surinam, and is considered as a harmless animal.


This, like the last, resembles coluber lineatus, being marked, as in that species, with five dusky stripes, the middle one of which is the broadest, and is nearly black, with a whitish speck on each of the scales. The head is ovate, covered with large scales, and marked with several oblong blue, subangulated spots, with black edges; and the tail is very long and flender. This animal is of considerable size, sometimes measuring four feet in length; it is a native of Asia, and is esteemed harmless.

Situla. Grey, with a longitudinal dusky band, bordered on each side by a black line. *Coluber situla*, abdominal scuta 256, subcaudal scales 45. Described by Haffelquist as a native of Egypt.


This is the ribbon snake of Catesby, a species about three feet in length, and very beautiful. The general colour is brown above, with three moderately-broad longitudinal blue-green stripes; the head is rather small and somewhat pointed, the body flender, and the tail thin. Catesby represents it as an animal extremely swifit in its motions; it inhabits Carolina and many other parts of North America, frequents trees, and is perfectly innoxious.

Vittatus. Whithif, with three black stripes, the middle one very narrow; abdomen white, with the edges of the scuta...
COLUBER.


The length of this kind seldom exceeds thirty inches; the colour is whitish, tinged with blue, and marked along the whole length of the back by three black or dark brown stripes, the middle one of which is the narrowest; between this and the principal longitudinal stripe on each side is a pair of extremely narrow or linear stripes, which are gradually lost after passing some distance down the back. The head is rather small; of an elongated form, covered with large scales, and marked with black variegations; the tail is of moderate length, slender, and gradually tapering to a point. This snake is a native of South America, and is not of the poisonous tribe of serpents.

*Monilis*. Whitish, with broad brown bands, and three spots on the neck. *Coluber monilitis*, abdominal scuta 164, subcaudal scales 82. Linn.

A native of South America. This is a small species measuring about a foot and half in length; the colour whitish, banded throughout the whole length with very broad transverse brown bars; the head is of moderate size, whitish, and bordered with brown.


Length about eighteen inches. The form rather slender; head small, and marked at the back of the neck with a few transverse streaks; the spots on the back are somewhat rhomboidal, of a brown colour, lightest in the centre, and disposed in a triple fies. This snake is a native of India.


Described as a native of Egypt; the abdominal scuta are 195, and the subcaudal scales 102.

*Coccineus*. Black, with the back yellow, spotted with red, and the abdomen pale. *Coluber coccineus*, abdominal scuta 175, subcaudal scales 35. Gmel.

Length about two or three feet, form rather slender, with the head small, the ground colour black, with about twenty-three foveate spots of bright red, with the spaces between yellow. This is a native of South America.


General colour milk white, marked throughout with a row of deep brown ovate patches; the head is brown, and covered with large scales; tail of moderate length, gradually tapering to the extremity. This is a native of South America.


A native of America. This is of a moderate size, measuring about two feet in length; the head is rather large in proportion, and covered with scales of considerable size; body rather slender, and the tail tapering rather gradually from the body. The colour is yellowish brown, clouded with irregular deep brown, or black fuscous variegations disposed somewhat in the form of bands, and nearly surrounding the body.

*Padera*. White, with black dorsal spots, connected by a line and lateral spots. *Coluber padera*, abdominal scuta 198, subcaudal scales 56. Linn. A native of India.


This is a large snake, measuring nine or ten feet in length, and being rather slender in proportion; the colour above deep or blackish brown, variegated with numerous yellow specks, arising from the circumference of the middle of every scale being marked with an ovate yellow spot. On the sides of the body many of the scales are yellow on one half and black on the other, and by degrees appear more tinged with yellow as they approach the abdomen, which is clouded with a mixture of brown and yellow; the head is small, and covered in front with moderately large scales; the teeth rather large, and unaccompanied, so far as can be ascertained from the dried specimens hitherto examined, by any poisonous fangs.

*Schoeckei*. Cinerous brown, with a double white longitudinal band each side; abdomen whitish; throat yellowish, and speckled with brown. *Coluber schoeckei*, abdominal scuta 180, subcaudal scales 114.

Described by Linnaeus after Forskal, as being about a cubit and a half in length, and the thickness of a finger; the colours as above described, except that, as the snake advances in age, a narrow stripe, composed of small whitish spots, is observable down the middle of the back. The head is ovate, oblong, and covered with large scales, and the tail about a third of the whole length. A native of the woody parts of Arabia.

*Hoelliei*. Entirely red. *Forsk*. Forskal describes this as a native of Arabia. It is about a foot in length; the bite of this snake is said to cause an inflamed tumour, and its breath to excite an itching in the skin.


Length twelve inches; the tail is of a moderate length, and rather slender, and the scales beneath are plain. A native of America, and confederated, by some writers, as an inhabitant likewise of America.


This is a small species; the head is of a moderate size, rather long, and covered with scales of a larger size; tail long, and tapering gradually to a point. Inhabits South America.


Inhabits South America and India. The length is three feet; the scale on the body are obsolete, and ranged in eleven rows; the head oblong and flattened; tail slender, a foot in length, and pale beneath.

*Daara*. Coppery-grey, with the edges of the scales whitish; beneath white. *Coluber diera*, abdominal scuta 234, subcaudal scales 45.

The length of the snake exceeds a cubit; the thickness less than a finger. The head is ovate, oblong, and covered with large scales, of which those in the middle between the eyes are larger than the rest. A native of Arabia. *Forsk*.


*Fulvis*. Fulvous, spotted with brown, the body annulated with black bands, and the tail very short. *Coluber fulvis*, abdominal scuta 218, subcaudal scales 31.

Length
COLUBER.

Length about eighteen inches; the head brown above, and covered with large scales; a native of North America.

CONSTRCTOR. Shining black, with the body very long and slender. Coluber constrictor, abdominal feata 186, subcaudal scales 92. Linn. Black snake, Cateby. Carol.

According to Cateby, this is a large and very long snake, some attaining to the length of six feet; they are entirely of a shining black colour, and are very nimble and beneficial in killing rats, which they purify with wonderful agility to the roofs and all parts of houses and barns, where rats are able to run, and for this service are preferred by most of the inhabitants; they are bold and furious, leaping at and biting those that attack them, though no harm ensues, their bite not being venomous; it is commonly said, in Carolina, they will attack the rattle snakes, and swallow them. "It is certain," says Cateby, "that all will attack one another, not only of their own but of all other kinds, which I have often seen; one, after a long struggle, swallowing another, but little less than itself."

SIRTALIS. Brown, with three blueish-green bands. Coluber fortis, abdominal feata 175, subcaudal scales 114. Linn. Described by Kalm as a Canadian species.

DECORUS. Blue-green, with a double lateral band of black, and black spots on each side the neck. A species described by Dr. Shaw, from a specimen in the British Museum. Its habit is slender and flagelliform; length about two feet and a half; the colour pale, blueish, gilded green, with iridescent variegations; beneath paler, or more inclining to white; on each side the body, near the abdomen, a double black stripe; head longish, covered with large scales, incommutated, and marked each side, through the eyes, by a broad dark black stripe broken into spots, and which, passing to form little distance along the neck, becomes divided, and forms the double lateral stripe before mentioned. The eyes are large; tail very long and slender.

DOMICELLA. White, with numerous deep black transverse bands meeting beneath, and a blackish abdominal line. Coluber Domicella, abdominal feata 118, subcaudal scales 6. Linn. Argus biolor elegans minus obscurus, Siba. Length about two feet and a half, diameter half an inch; the head is small, covered with large scales; tail rather short and tapering to a point. This is a native of India; it is said the ladies in India sometimes carry this snake in their bonnets, and hence Linnaeus named it domicella.

VIRIDISSIMUS. Bright green; abdomen whitish, with the feata dilated towards the middle. Coluber viridissimus, abdominal feata 157, subcaudal scales 122.

This beautiful snake is a native of Surinam. The length is about three feet; head slightly obtuse, of moderate size, covered with very large scales; the remainder of the upper parts with ovate scales; the tail is of moderate length and slender. The green on the back inclines more or less to blue or purple; in different individuals, and the abdomen in some than in others. It is esteemed a harmless species.

CURSOR. Greenish, with two dorsal stripes of linear white spots, and whitish scales and abdomen.—La Courtez, Cepede. Abdominal feata 185, subcaudal scales 105.

A species described by La Cepede, from a specimen in the Royal Cabinet at Paris. The length is about three feet; the head is covered with large scales, the tail of moderate length and gradually tapering to the tip. It is said to be a timid animal, and remarkable for the frowsifs of its motions. It inhabits the island of Martinico.

HISPANELLA. White, speckled above with blue, and variegated with blue on the abdomen. Serpens Hispanella Americana, Siba.

A native of South America, where it frequents houses, and is very useful in destroying rats, mice, and other vermin. It is about two feet and a half in length, the thickneds moderate, head oblong, and covered with large scales, tail rather short, and gradually tapering.

PERLATUS. Pearl-coloured; head and tail sea-green; the former marked by a red spot. Serpens ex novo Hispania, a Fabro Lynco. This snake is about two feet and a half in length, and rather thick, except towards the tail, where it gradually tapers to a slender point; the top of the head is covered with small scales except about the nape and between the eyes. It is a native of New Spain.

PLATONUS. White, spotted with brown, and annulated with broad brown zones. Shaw Gen. Zool. Described from a specimen in the museum of Dr. William Hunter. It resembles the common snake C. matrix, but the tail is rather more slender in proportion; the head is rather large, and covered with large scales of a black brown colour, elegantly marked with intervening spaces of white; the whole animal is about three feet and a half in length.

ARUS. Chestnut-brown, banded with transverse rows of ocellated red spots; beneath yellow. Coluber argus, Linn. Serpens arabicus brasilifusus boboboca, and Boiguacu dilia; alias argus, Siba.

The argus snake is a large and elegant species, measuring, according to Seba, above five feet in length, and being of a moderate thickness in proportion. The head is large, flatish, covered in front with small scales, and so very protrudent on each side at the hind part, so as to appear heart-shaped. The ground colour is brown, very beautifully marked from head to tail by numerous transverse rows of round ocellated red spots, surrounded by a white iris, and an exterior red one; the abdomen beneath is pale yellow; tail moderately slender and tapering to a point. It is a native of Arabia, and seems to be considered as a poisonous species.

OCELLATUS. Chestnut-brown, with ocellated brown spots, and yellow abdomen. Serpens guineensis rarissima argus dilia, Siba.

In size resembles the viper; the head is covered with small scales; tail tapers to a moderately slender tip. This, according to Seba, is a native of Guinea, and is a rare species.

CHIAMELLA. Blue, the scales marked with a white spot, body beneath yellow. Serpens americana chiamella dilia, Siba.

A beautiful species about four feet and a half in length, found in the West Indian islands.


CATUS. White; the scales disposed in fours, black, and thickly crowded into patches. Coluber catus, Gmel. Coronella catus, Laur. Amph.

A native of America; it is observed of this snake that it lies in wait, and springs upon mice like the cat, whence its name.


TESSELLATUS. Above alternately tessellated with black and brown; beneath black with white unequal spots each side; head long and shielded. Gmel. Coronella tessellata, Laur. Amph.
**C O L U B E R.**

**R u b e x.** Bright red with the spots alternately unting; beneath white. Gmel. A doubtful species.

**M o l e r u s.** Abdominal plate 248, subcaudal scales 59. Gmel.

This kind inhabits South America, and resembles the Boa tribe, but is distinguished by the plates, and large scales on the head, as in the coluber genus.

**M i n e r u s.** Glauces, with a brown dorsal stripe, and three on the head; abdominal scuta 238, subcaudal scales 90. Linn.

Length about eighteen inches; thickness exceeding that of a fawn quill; the colour glaucous, with a broad, longitudinal, brown band down the back, and three longitudinal bands on the head, two of which pass through the eyes. The head is oblong, ovate, convex, and smooth; the eyes large; tail slender, and measuring about a third of the whole length. Described by Linnaeus from a specimen in the museum Adolphi Friderici brought from the East Indies.

**S c u t a t u s.** Black; scuta extremely broad; tail sub-triangular. *Coluber scutatus*, abdominal scuta 190, subcaudal scales 90. Pallas.

Refines the common snake, *coluber natrix*; the length is about four feet; colour entirely black, except that the abdomen is marked alternately on each side with a row of smallish square yellowish-white spots. The principal character consists in the scuta being remarkably wide, extending on each side in such a manner as to embrace two-thirds of the body. This species was observed by Dr. Pallas about the borders of the river Ural; it is found occasionally both in the water and on land.

**H i p p o c r e p i s.** Livid, spotted with brown, with a reversed humeral or horde-shoe mark on the back part of the head. *Coluber hippocrepis*, abdominal scuta 232, subcaudal scales 94. Linn. Muf. Ad. Fr. *Natrix hippocrepis*, Laur.

Length about twelve inches; head of moderate size, marked by a transverse arched brown band between the eyes, and a larger horde-shoe-shaped mark on the back of the head; abdomen pale; tail tapering gradually from the tip. A native of America.

**D o m e s t i c u s.** Grey, spotted with brown; a bipartite black spot between the eyes. *Coluber domesticus*, abdominal scuta 245, subcaudal scales 94. Linn.

This is a native of Barbary, where it appears to be in some degree domesticated, being very common in the houses of the inhabitants, where it is kept to destroy the smaller kind of noxious animals. In its general appearance this snake is allied to the lat-mentioned species, and like that is perfectly harmless.


**E x a l b i d u s.** Whiteish with transverse broad spots mixed with black and white.

*Coluber exalbidus*, abdominal scuta 135, subcaudal scales 42. Gmel. *Coluber exalbidus maculis transversis latifinis et albo mixtis*.

**C a r h i n u s.** Grey, with large oval brown spots on the back, and small quadrangular notched spots on the sides; beneath silky white. *Coluber cabarinus*, abdominal scuta 239, subcaudal scales 82. Forik. Fn. Arab.

Inhabits Cahir. Length four feet and a half, and the thickness that of a finger; the head is flattish, sub-cardinated, with two pale oblong scales on the crown.

**C a l a m a r i u s.** Livid, with transverse brown bands and linear points; beneath teltellated with brown and white.

*Coluber calaminus*, abdominal scuta 140, subcaudal scales 22. Linn.

This is a small snake, measuring about a span in length, the thickness that of a goose-quill; colour above livid, sprinkled with linear dusky spots, and marked by several dark narrow transverse bars; the head is very small, convex, and ovate; the tail short and terminating obtusely. This species inhabits America.

**C a r i n a t u s.** Lizard-coloured, with large ovate, porous scales; back carinated; abdomen whitish. *Coluber carinatus*, abdominal scuta 157, subcaudal scales 115. Linn. Muf. Ad. Fr.

A large species, growing to the length of five or six feet, and of a moderate thickness; tail tapering gradually to a point; tail much carinated, rising into a ridge on the top; colour deep blueish brown, or cincereous, inclining to lead-colour, paler or whitish underneath; scales very large and marked with numerous impressed points as if pierced with pin-holes. This is represented as a harmless species; it inhabits North America, and varies in colour.

**G e t u l u s.** Blueish-black, with linear yellow lines on the sides and bifid bands on the belly. *Coluber getulus*, abdominal scuta 215, subcaudal scales 44. Linn. D. Garden.

Inhabits Carolina, where it frequents moit woods and shady places, and preys on lizards. Length about three feet. An elegant species.


Length from two to three feet; the colour brownish-yellow or livid, with a dusky and lateral stripe of confluent spots immediately above the centre, the anterior ones of which have a white dot in the centre. The abdomen is pale, and marked with three or sometimes four rows of small dusky spots. The head is covered in front with large scales, smooth obtuse; tail thick and rather blunt. The specimen described by Linnaeus measured, as above-mentioned, less than three feet, that described by La Cepede, a specimen in the Museum of the king of France, was more than six feet long, from which it appears this snake is of a large size when full grown.

**B a t a e n.** Spotted with black and white. *Fork. Fn. Arab.*

Described by Forskal as a native of Arabia; it is a foot in length and two inches in thickness, and is highly poisonous; the body swelling to a great size after being bitten by this snake.

**H a n n a c h i.** Entirely black. Gmel. Inhabits Arabia, a cubit in length, and as thick as a finger.

**P u r p u r a c e n s.** Abdominal scuta 189, subcaudal scales 122. Gmel.

**P i c t u s.** Abdominal scuta 172, subcaudal scales 142. Gmel. Boddaert.

**H a j e.** Black, with oblique bands, and scales half white. *Coluber haje*, abdominal scuta 207, subcaudal scales 109. Linn.

First described by Forskal. This snake inhabits Lower Egypt, is of a very large size, when irritated lifts up, and stretches out its head to bite.

**P u l l a t u s.** Bands of the body black with white dots; temples hoary with black spots; beneath white with black spots. *Coluber pullatus*, abdominal scuta 217, subcaudal scales 108. Gmel. A native of Asia.

**C a r a c a r a s.** Blue, with the scales on the fore-part of the
the body elongated; those behind rhomboidal, and the neck transversely frilled with black. Coluber caraceras, abdominal scuta 120. subcaudal scales 125. Linn. Serpens caraceras brasiliensiis singularis, Seba.

A species of moderate size, length two feet and a half; the head rather large and oblong; snout obtuse; from behind each eye a black streak; colour pale blue, the posterior part of the body tinged with rote colour; the scales on the fore parts of the animal are of a narrow lengthened form; and on the hind parts rhomboid; neck and anterior parts elegantly marked by numerous transverse black lines; tail rather long, and gradually tapering to the tip. This species inhabits Brazil.

Stolatus. Glauces, with two whitish stripes, and quadrangular transverse brown spots between. Coluber floslatus, abdominal scuta 143, subcaudal scales 76. Linn. Laurentii. Seba.

Described from a specimen in the Museum Adolphi Friderici as a poisonous snake, but it appears erroneously so. This species inhabits India. It is of the middle size, measuring from a foot and a half to two feet or more in length. The colour is blue above, with two rather remote white lines down the back, and a continued series of brown, transverse, equidistant zones. The abdomen is pale or white, each feutrum being marked on each side by two small specks; the head is covered with large scales, pale or blue above, and of moderate size; tail rather short and tapering to a point.


Length two feet and a half, and of moderate thickens in proportion; general color dull orange, with a broad dorso line of pale yellow; head rather large and covered with very large scales; tail rather short and tapering to an obtuse point. Inhabits South America.

Pallidus. Grey, speckled with brown, and marked with a double, interrupted black line on each side. Coluber pallidus, abdominal scuta 156, subcaudal scales 95. Linn. Amoen. Acad.

Linnaeus describes this as being a foot and a half in length, and the thickens of a fawn-quill, with the back slightly angulated each side. The head is roundish, much thicker than the neck and covered with large scales; the ground color pale variegated with scattered grey spots and points. Inhabits India.


Olivarius. Abdominal scuta 203, subcaudal scales 73. Gmel. Guingouya, Pf. Brasili. We only know of this species that the plates and scales are as above described, and that the species inhabits America.

Cenchria. Head globoso; body whitish, with transverse rhomboidal brown bands. Coluber cenchria, abdominal scuta 210, subcaudal scales 144. Linn. Anguis de cenchria americana, Seba.

A long and very slender species, growing sometimes to the length of three or four feet, and yet scarcely exceeding the thickens of a fawn-quill. The head is very large and nearly globular, the neck extremely thin; and the tail remarkably long, measuring nearly a third part of the whole animal, and gradually tapering to the extremity. The colour is white or yellowish, marked throughout the whole upper part from the head to the end of the tail, with numerous transverse rhomboidal bars, or patches of brown, the points of which descend on each side.

Flagellum. Extremely long; slender, and brown; abdomen pale. Coach-whip snake, Catefly.

This species measures from four to five feet; or even six feet in length, and is remarkably slender. Catefly, who describes this snake, speaks of it as an active nimble creature, running very swiftly and being perfectly harmless. "Yet, says he, the Indians report, not without gaining many profylets to their silly belief, that it will by a jerk of its tail, separate a man in two parts." This snake is a native of Carolina and Virginia.


The general colour is a bright blue green with a golden glint, and highly iridescent. The length is from three to four feet, and the diameter about three-fourths of an inch; the head is covered above with large scales, and the snout is slightly elongated, though not pointed; the tail is somewhat angular, and of considerable length. It is an innocuous species, is found in several parts of India, and is esteemed one of the most beautiful of the serpent race.


Long and slender, the general length about three feet; the head is obtuse; colour of the upper parts blue green, slightly tinged with purple; tail very long and slender. This kind inhabits many parts of North America, where it frequents trees and preys on flies and other insects. Catefly, to whom we are indebted for the above particulars, adds, that it is easily reclaimed from its natural wildness, becoming tame and familiar, and affirms that some people carry it in their bosoms.


Length about twelve inches, and thickens of a goose-quill; the colour above black, appearing like a broad dorso stripe, beneath white; the head is ovate, twice the diameter of the body, above black and beneath white; tail about one-third the whole length, very slender, and sharp-pointed. A native of India.


A small species, less than an earth-worm; head and upper parts jet black, and glossy; the head rather large, and covered with large scales; eyes flame-colored. This is a native of Pennsylvania where it inhabits crevices of rocks, old walls, &c. and feeds on insects.

Sipedon. Entirely black or deep brown. Coluber sipedon, abdominal scuta 144, subcaudal scales 73. Linn. A native of North America; described by Kalm.

Daboya Snake, Le dabota, La Capece. Described by La Cape who considers it as the species which in the kingdom of Juda, and some other parts of Africa, is regarded as a deity, and kept in temples consecrated to its worship. This superstition is said by the traveller, De Marchais, to have arisen from the following circumstance; the army of Juda being on the point of yielding to that of Arda, it happened that a large serpent of this species made its appearance, which the chief priest probably.
probably knowing it to be innocuous lifted it up in his arms and displayed as a kind of miracle, or at least as a proposi-
tions omen, persuaded the army again to rally, by which means a signal victory was obtained, and the animal was in
consequence exal ted to a divinity. It is said to arrive at a
very considerable size, and is of a whitish colour, orient-
mented on the upper part throughout the whole length by a
triple row of large oval ru fous patches bordered with
black, the head is rather large, and is covered with oval ca-
rinated scales similar to those on the rest of the animal.
The individual described by La Cepede was preserved in
the Royal Cabinet, and measured three feet five inches in
length.

Brazilian Snake, La brophane. La Cepede.
Length three feet; head and body covered with oval ca-
rinated scales, snout terminated by a large and almost perpen-
cular scale rounded at the top, but emarginate at the bot-
tom for the passage of the tongue; upper parts of the ani-
mal marked with large oval frous patches bordered with
black, and in the intervals between the large patches are se-
veral much smaller ones of a dusky colour; fangs very large.
This is a native of Brazil, and La Cepede believes may be
about six feet in length when it has obtained its full size.

Triangular-headed Snake, La tricéphalte, La Cepede.
Reminiscence of the common viper in general appearance.
The colour is greenish, with spots of different shapes on the
head and body, uniting so as to form a regular band down the
back; abdomen dusky, edged with white. The head is of a
more triangular shape than usual, and covered with smooth
scales, as are likewise the body. Its total length is
two feet. This kind inhabits the island of Eufatia.

Panther Snake, La tigrée, La Cepede.
Alied to the last; length about eighteen inches; head
as in the common viper. Colour of the upper parts whitish,
rufous, with dusky spots bordered with black like those on
the skin of the panther or leopard. The native country
unknown.

The coluber hydus, and coluber latiaudatus of Linnean,
are excluded from the above, and will be deferred under
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adopt. They are generally distinguished from the col-
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ing gradually thicker, scaled, and the tail compressed.
See Hydus.

COLUMBRAIA Infusa, in Ancient Geography, an island of
the Mediterranean sea, near the Baleares. Pliny says
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present isle of Formentera, and the name with that which
the Greeks called Opduna, from εφι, obit, a serpent. It
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COLVILLE, Cape, in Geography, a cape on the east
coast of New Zealand; lying in S. lat. 30°26’. E. long.
194° 27’. This cape rises directly from the sea, to a
considerable height, and is remarkable for a lofty rock,
which may be distinguished at a very great distance.
From the S. point of this cape the river Thames runs in a direct line S. by E., and is no where less than
tree leagues broad for the distance of fourteen leagues
above the cape, and there it is contracted into a nar-
row stream, but continues the same course through
a flat country, or broad valley, which lies parallel with the
sea-coast. On the east side of the broad part of this
town the land is tolerably high and hilly; on the west
side it is rather low, but the whole is covered with verdure
and wood, and has the appearance of great fertility, though
there were in Cook’s voyage, Nov. 1779, but a few small
spots which had been cultivated. Six leagues within cape
Colville, under the eastern shore, are several small islands,
which, together with the main, seem to form good harbours;
and opposite to these, under the western shore, the other
islands of which, probably, good harbours may be found.
The river affords good anchorage, and is defended from the
town by a chain of islands, lying across the mouth of it, and
on this account called by Cook “Barrier Islands”; these
of Baffin, and La Cepede believes may be
about six feet in length when it has obtained its full size.

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LIVIA. Stock dove. Wings with a double blackish band, called by Buffon \textit{bifet}, and by Albin the \textit{flock dove}.


CRISŢATA. Crested pigeon. Head ered; legs hislute and cinerous. \textit{Pigeon huppis}, Buff.

NORVEGICA. Norwegian pigeon. Head ered; legs hislute and irony. Frisch.


JUBATA. Turner pigeon. Cere hanging down from the crown like a mane. \textit{Turner pigeon}, Will.


This bird, is eight inches and a half in length. The bill is red, with a black tip; the irides red, and surrounded with a warty skin of the same colour; the upper parts of the body are rufous, with a purplish hue; the under part of the neck, with the bright flesh colour; belly, fider, and vent, somewhat rufous; under wing-coverts, quills, and tail rufous; legs red, with the claws black. Those birds inhabit Cayenne; they build in trees which have the boughs hanging low, and line their nests with hair and cotton. They feed on the berries of the myrtle. Dr. Latham suspeets, that this species is found in St. Helena, as a bird Vol. IX.

is mentioned in Mr. Anderson's catalogue, under the name of \textit{columba peninis}, and which is said to be very common in that island. A kind of pigeon, conceived to be a variety of the above, is described by Edwards; the forehead is of a clay colour; the head and neck, reddish purple; back, wings, and tail, red brown, with a gloss of copper-colour; the fore part of the neck is reddish clay colour; breast, belly, thighs, and under-tail-coverts, light clay colour; a white mark on each side under the eye, and another at the side of the throat, and all at the joint of each wing.

TETRAOIDE. Head, and neck black, with white margin. \textit{Scop. Tetraonir pigeons}, Lath.

The only account we have of this bird, is from the work of Strickland, Ann. t. p. 155. He informs us it equals the red-legged partridge, with a fire, and that the head and neck are black, and encompas'd with a white margin, as in that bird. The description was taken from a bird living in a menagerie.


Breed in vall numbers among the rocks on the coasts of Jamaica, St. Domingo, and the Bahama islands; and fubits on the berries of the sweet wood. The length is ten inches and a half; the bill red with a white tip; the eyes surrounded with a white skin, the irides yellow; crown of the head white, beneath changable; neck green and blue, varied with a gloss of copper; the quills, feathers, and tail are brown; the legs red, with grey claws.


This bird is the same size as the common turlte, and measures in length eight or nine inches. The bill is dally black. A fine blue skin surrounds the eyes, and according to the figure in the plates of Edwards, goes on to the blade of the upper mandible. The irides are crimson; the forehead, checks, and front of the neck and breast, pale rufous brown; hind part of the head and neck dull brown. The upper part of the body is dark brown, with a mixture of blue; greater wing-coverts the same, but the outer margins, and tips are white. The two middle tail feathers, are the same colour as the back, the red dull ash, with white tips; red legs, with black claws. The white winged dove, inhabits the East Indies, and is observed to flite up its tail at intervals, like the common wagtale.

FUSCA. Fuscous; eyes black; neck and breast white, undulated with black. Jacc. Betyr.

This is the size of the turlte, and inhabits Carthagenia, in America. Latham considers it as a variety of the last.


About the size of a turlte; the length nine inches and a quarter; the bill is red, and the eyes are surrounded with crifion tubercles; the head, neck, and upper parts of the body, are chestnut glossed with violet; the under parts of the body, more or less rufous; the quills the same as the upper, but on the outer edges only, the inner rufous; the tail feathers, the fame on both margins; legs reddish with brownifh claws. Inhabits Martinico. \textit{Le pigeons de la Martineque} of Briffon, and which Buffon calls \textit{Le pigeons roux de Ceylene}, is considered as a variety or rather the fe-
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Male of the above mentioned bird; it is of a reddish brown colour, with a collar of golden violet; the wings are spotted with black; lateral tail feather black at the end, with the tip white. Inhabits also Martinico.


The length of this species is nine inches. The nostrils are much elevated, and form two tubercles at the base; the top of the head, with the under parts of the neck and body are in this bird half part of the neck varied with blue and purple; back, rump, and upper tail-coverts, purplish brown, with a light reddish tinge. This bird is found in the islands of Jamaica, in the month of January. It feeds on berries, frequents trees, and has a mournful note, which is sometimes very loud and disagreeable.


The crowned pigeon is nearly the size of a turkey, in which particular, it far exceeds any other species of the same tribe. Brisson has placed it with the pheasants, and his example is followed in the planche enfumées, but the bird possesses in every respect, the manners of the pigeon tribe; its note is cooing and plaintive like those birds, only louder in proportion. We are told, the mournful notes of these birds, alarmed the crew of Bougainville very much, when they touched in their voyage at one of the islands they inhabit, as they multiholk it at first for the cries of the human species.

The crowned pigeon, we are assured by Scopoli, has been known to build its nest and lay eggs in Europe, though the young were not hatched; they made a nest on trees in the monasteries, where they were kept, composed of hay and flax. The female it is observed never fat, but flock upon the eggs, and it is supposed by Scopoli, that it must be from this cause alone, these eggs proved abortive. In the East Indies, they are occasionally kept in court yards like other domestic poultry.

CRISTATA. Reddish brown, crested; under side, head, and neck, black; back and tail green; front with five very long, erect feathers. Columbia cristata, Gmel. Le coucou de Malacca, Sonnerat. Uncommon bird from Malacca, Phil. Trans. Lesser crowned pigeon, Lath.

The bill of this species is conical and rather bent; the colour black, except the under mandible, which is yellow at the base. On the fore part of the head, are fix very long black finely hairs, which stand upright, and may be depressed or elevated by the bird at pleasure; on the back part of the head, is a crest of a gilded red colour, composed of hard and stiff feathers. The space between the two crests is white, forming a band across the head. The eyes are encircled with thin white feathers. The legs are yellow; the toes are separated at their origin, and the hind claw isdlittle of a claw. Size of the common pigeon. A variety of this bird, formerly in the Leverian Museum, measured ten inches in length; the bill was yellowish, with the tip black; the back part of the head, crested as in the former; the forehead white, paling backwards on each side beyond the crest; the eyes were surrounded with feathers of a reddish colour, which palled backwards in a point; the head and neck were deep reddish brown; breast, belly, and vent, yellow black; the legs fine reddish brown; back, rump, and tail, dull brownish green; tail covert long and falling over the tail; legs reddish yellow, with black claws. The history of this bird is unknown, but it is considered as a variety, or possibly a sexual difference.


The pompadorus pigeon is a native of India, and appears to be most common in the island of Ceylon. It is constantly seen on trees, and for the most part on those known by the name of Warlingia grahamii, on the berries of which it delights to feed. They are shot by Europeans, who esteem them excellent eating: the natives take them with birds nets. The fize is less than that of the common turtle; the back, breast, and belly, are pale green; the wing-coverts of a fine purplish brown; tail green; and legs red. The female is paler, and has the wing-coverts the colour of the body. These birds are common in the country about Bengal, where they are called covania; it is said to have a whistling note, resembling that of the thrush.

ERYTHROPELA. Black; eye-brown, and front white; neck above, shoulders and wing-coverts garnet colour; tail from the base to the middle cincinnius; legs brown.

Length nine inches and a half; tail two inches and a half long and even at the tip; legs brown.

This inhabits the island of Eimeo. Another bird much resembling this, and supposed to be the female, was met with at Oahu: the forehead, throat, front of the neck and breast, were white, the hind part of the neck dusky; over the eye a ferruginous streak, passing a little downwards on each side of the neck; the back dusky black; belly dusky; quills and tail blackish. Another analogous kind, found in the South Sea islands, is of a reddish brown colour, with the breast, and eye-brow white, and the legs red.


A native of the island of Panay. It's size is equal to that of the common pigeon; the bill dull red with the irides yellow; the lesser quill feathers are green, with a metallic fulvous, and on the arm-pits is a semi-circular spot, half grey, and half green; the legs are dull red.


Size of the turtle; the bill scarlet and ten inches in length; nostrils blueish; forehead white, with a streak of the same through the eye. The sides of the head, neck, and breast is reddish, the hind part deep; upper part of the tail and wing-coverts green gold, glossed with coppery; ridge of the wing spotted with white; lower part of the tail, rump, and upper tail-coverts reddish brown; quills brownish, and russet next the base; tail three inches long; two middle tail feathers black; the rest cinereous, with the tips black; legs red, with black claws. A native of Ambon. Jacquin describes a variety of this bird, having the quills and tail feathers green; wing-coverts violet; and the rump and vent blue.

PURPURATA. Green; cap scarlet; vent fulvous; head, neck, and collar white. Columbia purpurata, Gmel. Purpurata pigeon, Lath.

A general inhabitant of the islands in the Pacific ocean, and subject to considerable variations in the colour of its plumage. The natives of Tongo Taboo call it horalor, those of Omate Oopa, and Oopara. It lives on the banana, and is easily tamed.

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Rather smaller than the common dove; the bill is yellow, the fore part of the head of a deep pink, resembling the colour of the blossoms of the jambos, whence its name of jambos pigeon; the back, wings, and tail are green, with the breast and crop white; the eyes are yellow, and from the orbits to the breast extends a white streak, edged on one side with green, and on the other with pink. This is a native of Java, and feeds chiefly on berries.

RUDEOPIZA. Violet-black; cap and orbits of the eye naked and red; neck, upper part of the back, and breast greyish. Columba atricapilla, Gmel. Le pigeon violet à tête rouge d'Antique, Soum. Red crowned pigeon, Lath.

Found in the isle of Panay by M. Sonnerat. This bird is the size of the jacobin pigeon. The bill is grey. At the base of the upper mandible is a thin membrane of a bright red colour entirely encircling the eye; legs grey.

PURPELA. Green; head and neck purplish; breast fulvous; vent scarlet. Columba purpeala, Gmel. Purple pigeon, Brown, Lath.

Size of the common wood-pigeon. The front is pale green; breast orange; back, leaupipers, and belly light grey; quills dirty. A native of Java where it is called sipon.

EMBREUS. Greenish brown; front, collar, and beneath vinaceous; crown and neck above brown; double band on the breast purple and white. Columba gencerus, Gmel. Purple pigeon, Lath. Inhabits the island of Eimeo. Length fourteen inches.


Inhabits the islands of Manilla and Panay. The female is of a greenish-grey, and greenish yellow beneath. The species is rather larger than the turtle.


Size of the common turtle; length ten inches and a half. The bill is greenish; crown grey; tail beneath black at the base, and at the tip whitish; legs grey or red. A native of Ambina.


The size of the common pigeon; the eyes are black, surrounded by blue orbits, with the wings and tail of the tip brown. Inhabits the island of St. Thomas.

CURVOOSTRA. Green; beneath yellowish; vent white; back and shoulders bay; wings with two yellow bars; middle tail feathers green; lateral ones cinereous with a black band. Columba curvostra, Gmel. Hook billed pigeon, Lath.

Inhabits the isle of Tanna in the South Seas; the bird, supposed to be the female of this species, differs from the male in having the back and shoulders green, and the under tail coverts, together with the vent white.

TANNENSIS. Green; wing-coverts spotted with white; secondary quill feathers edged with yellow at the tip. Lath.

Described from a drawing in the possession of Sir Joseph Banks. The bird is eleven inches in length, and inhabits the isle of Tanna. This is, perhaps, only a variety of the last.


A native of the island of Jamaica, Cuba, and other warm parts of America. Size of the common pigeon.

PACIFICA. Back greemish brown; head, neck, breast, and abdomen cinereous white; tail blackish. Columba pacifica, Gmel. Ferruginous veiled pigeon, Lath.

The length of this species is thirteen inches and a half; the nostrils are gibbous, the throat whitish; breast vinaceous, and the legs either red or brown. It is a native of the Friendly Islands. A variety of this species has the head, neck, breast, and belly whitish; back, wing-coverts, and tail greenish, and the bill gibbous at the base. This inhabits Otaheite and Tongataboo.


A native of Mexico; the irides are black; the legs red. Nativé. Above fulvous, spotted with black; beneath pale fulvous, under tail-coverts, and beneath the wings, cinereous. Columba mexicana, Gmel. Genus mexicana, Buff. Hoilolat, Ray. Black spotted pigeon, Lath.

Inhabits the farna country as the last, and frequents woods; size of the common pigeon.


PALUMBUS. Cinerous; tail feathers black on the posterior part; primary quill feathers white on the outer edge; neck on each side white. Columba palumbus, Linn. Le pigeon ramier, Buff. Columba fassinnola, Cetti. Ringel taal, Gueth. Ring pigeon, Lath.

Inhabits the woods of Europe and Siberia, and builds its nest on trees.


Inhabits the Molucca islands, and feeds on the nutmeg: its size is equal to that of the ring-pigeon. A variety of this species is described by Sonnerat, under the title of Pigeon oviree manqueur de myracle, and which appears to have been found in New Zealand; another variety has been met with at Amsterdam Island, where it is called Oruola ya.


This bird inhabits New Guinea, and is described by Sonnerat, who mentions its feeding on nutmegs, observing, that it is probably only the outer skin which serves them for nourishment, as the nut itself is voided whole, and so little altered, that, after passing through the organs of digestion, it is not rendered leis fit for vegetation; and hence it happens, that these birds flying from one island to another, different;
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perfe, and sow the seeds of those valuable plants in every part they frequent. A variety of this species having the tail white instead of black.


Inhabits the rocky parts of Africa, and is in particular common about the Cape of Good Hope. The size is that of the wood pigeon; its bill is brown, irides yellow; head and neck cinereous, upper parts glossed with violet and purple; rump and belly white.

CARIBEA. Blueish; abdomen white; head, lower part of the neck, and breast purplish; tail feathers transversely with black. Columba caribea, Gmel. Columba cauda festiva notata, Ray. Ring-tail pigeon, Lath.

A bird the size of the ring-pigeon, and which is found in all the woods of the Caribbee islands. It is in great esteem for food, each bird selling for the table at the price of a dollar. In Jamaica it is frequently called the montain pigeon. A fantastic variety of this bird is described by Jucquin, which has the tail conical; the orbits bare of feathers, and yellowish, and the body bluish; the tail of the tail-mentioned bird is as long as the body, and is destitute of the black band fo conspicuous in the ring-tail pigeon. We conceive this ought fearlessly to be considered as a mere variety.

ZEALANDICA. Red; abdomen white; rump blue; tail black. Columba nova iselandica, Gmel. New Zealand pigeon, Lath.

A native of New Zealand, observed by the English circumnavigators, in Dusky bay, where the inhabitants call it Hugarréron. The length of this bird is eighteen inches. The bill and irides are red; quill-feathers dusky; vent blueish.

BRUNNEA. Cap, neck above, back, and wing-coverts brown; breast, neck beneath, and the rump shining green. Lath. Inhabits New Zealand; the bill and legs are fanguineous.


This beautiful bird is a species recently discovered, and was first described by governor Phillips, in his account of Botany bay. It is the size of the common wild pigeon, and appears to be found chiefly in Norfolk island. The most remarkable character of the bird is the rich band of coppery-gold across the wings; a few spots of the same colour occurs also on the lesser wing coverts. Its bill and legs are red; quill-feathers brown, beneath rufous; the two middle tail-feathers brown, the rest pale lead colour.


The length of this species is ten inches and a half; its size that of the common pigeon. The bill and legs are red; the eyes placed in a bare reddish skin; the feathers on the neck are narrower than the others, and have a mixture of ash.


A native of Madagascar. Length twelve inches; bill lead colour; eyes and legs fanguineous; posterior part of the abdomen and thighs spotted with black. Perhaps a variety of the last.

Francisc. Blue; orbits naked; rump and tail red; feathers of the neck long, narrow, and pointed at the end. Columba francisc, Gmel. Le pigeon hollandais, Sonner. Hackled pigeon, Lath.

This bird considerably exceeds the ring-pigeon in point of size. The bill and irides are crimson; the feathers of the head, neck, and breast are long, narrow, pointed, of compact texture, and with a deeply polished surface. It inhabits the Isle of France, and is never eaten, the flesh being reputed poisonous.

Maculata. Deep green; body above spotted with white; belly blackish; tail black, with the tip ferruginous. Columba maculata, Gmel. Spotted green pigeon, Lath.

Described by Dr. Latham from two specimens, one in the collection of general Dawes, the other in that of sir Joseph Banks. The length is twelve inches. The bill black, with the tip yellow; the general colour is dark green, with a glossy surface; the head and neck darker than the rest. The feathers of the neck are long and narrow; every feather of the wings and scapulars are marked with a pale cinereous-white, and sub-triangular spot; the quill-feathers are black, with the tip cinereous; the legs are brown, and are covered half way down with downy feathers. The native place of this species is unknown.


This is one of the most splendid of the pigeon tribe. Its size is that of the common pigeon; the bill is dusky; the irides hazel; head, neck, breast, belly, and thighs, and under tail-coverts dark blue-purple; the feathers on the neck are long and pointed, and with the upper parts of the wings are of the finest green colour, glossed with the most vivid hues of red, blue, copper, or golden. The tail and upper coverts are white; legs reddish. The female is distinguished by the plumage being less brilliant and glossy, and in having the pointed feathers of the neck shorter than in the male. These birds inhabit the isle of Nicobar.


Rather larger than the common turtle. The bill is red, covered with a white cere; the head ferruginous; neck and breast varied with rufous white and purple, each feather being rufous, with a white mark, and the margin blue, gives the whole plumage in this part a beautiful undulated appearance; the back and wings are ferruginous; quills darker than the rest; tail dusky black, and rounded; the legs red. The female is marked in the same manner as the male, but is much diller in colour. A native of Cayenne.


The turtle is a general inhabitant of Europe, China, and India, and appears to be most frequent in Turkey and the southern parts of Russia, and in the rocky country beyond the lake Balkal. In England those birds are not uncommon during the summer, but it is only in this season that
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they are offered with us, for they arrive late in the spring, and depart in autumn. They build on the highest trees in thick and deep forests, and lay two eggs like the other kinds of pigeons.

It is related by baron de Tott, that this bird is highly favourable in the Turkish dominions, where it is extremely plentiful, government allowing a certain rate per cent. on the duty imposed on ears that those birds may be allowed to feed un molested. A crowd of them constantly alight on the eves which crows the port of Constantrine, and carry the corn uncovered either to the mills or magazine, and the boat-men never oppose them. This permission to feed on the grain brings them in great numbers, and familiarizes them to such a degree, that they are seen standing on the shoulders of the rowers watching for a vacant place where they might fill their crows in turn. The same custom is mentioned by Sonnini.

"In the Leverian Museum (says Dr. Latham) is a bird shot in Buckinghamshire, which differs from the common turtie in having almost the whole side of the neck black, instead of a patch only, and instead of each feather being tipped with white, there is a round spot of white on each very near the end, giving the sides of the neck a most beautiful appearance." There were three of those elegant birds in the Leverian Museum, including the male, female, and young, all which are now preserved in the London Museum. Those we are perfuaded ought rather to be considered as a distinct species than a variety of the turtle. Two others, considered as varieties of this bird, are the Portland dove of Albin, and La tourterelle grifé de l'ile de Bourbon of Sonnerat, the first inhabits Portugal, as its name implies, and is of a brown colour, with the spot on the side of the neck varied with black and white, and the lateral tail feather on the outer side tipped with white; the other is distinguished principally by having the two middle tail-feathers black, and the lateral ones white. This inhabits Manila. Bidas the above Dr. Latham describes La tourterelle brune de la Chine of Sonnerat as a further variety of this bird in his "Synopsis," but in the "Index Ornithologicus," it is enumerated as a species under the name of orientalis.

Orientalis. Griseous brown; feathers on the sides of the neck black, with pale cinereous tips; band on the wings yellow. Chinige turtle, Lath.

A native of China, and of the size of the common turtle; the bill and irides are red; head, neck, breast, and back dirty brownish grey, palest on the breast; wings brown; rump and tail deep cinereous grey; belly and thighs vinous grey; legs red.

Egyptiaca. Tertaceous flesh colour; chin spotted; the feathers black, and two lobed, truncated and furfusons at the tip. Forik. Fn. Arab.

This bird is described by Forkal, who informs us it frequently frequents houes in Egypt; the bill is black; head violet and flesh-colour; oribits naked and bluish; back cinereous; breast violaceous flesh-colour; belly and thighs whitish; wings brown; the two outermost tail feathers cinereous at the base, black in the middle, and the remainder white; the two next on each side cinereous at the base, black in the middle, cinereous beneath, and whitish at the tips, the fifth on each side brown, in the middle pale black, the two middle ones wholly brown; legs flesh-colour.

Surinamenesis. Cinereous, beneath white; chin varied with black and green; bill blue. Columba furanamensis, Gmel. La tourterelle, Sonnerat. Surinam turtle, Lath.

Length ten inches; the bill long and slender, of a fine deep blue without, and red within; and the legs red. The species is thus described by Fermin, who informs us it is a common bird in Surinam. It lays eggs twice in a year, making its nest in woods on the highest trees; the flesh is juicy and delicious.


Exceeds ten inches in length; the female differs from the male in having the colours less vivid, and inclining to grey. Inhabits India, and the southern parts of Europe. La tourterelle grise de la Chine of Sonnerat is considered as a variety of this bird; it is of a brown colour, beneath vinaceous grey; crown grey; black crescent on the neck, above spotted with white; lateral tail feathers black, spotted with white. This kind inhabits China and Madras.

La tourterelle mulet, turuter hybridus of Briff. is also of this species; or, at least, a mixed breed between the common and collared turtles. The head, neck, and breast are vinaceous; the back dull reddish ash-colour; belly, beneath the wings, and tip of the tail as in the last mentioned bird; the quills are brown; legs languidus.


This is a native of China, and is the size of the last. The bill is blueish ash-colour; the irides white; crown of the head ash-colour; tail pale brown; legs red, and claws white.


Length nine inches and a half; the bill three quarters of an inch long, and of a pale horn colour; the nostrils pale blue; irides blue grey. The eyes are placed in a bare white skin, which passes to the nostrils; forehead, cheeks, and throat pale blue; top of the head and hind head incline to rufous; upper part of the neck, the back, and wing-coverts are brownish ash marked with transfuse arnated black bands; fides of the neck and body bluish, crossfed with blue, black, transfuse transverse lines; fore part of the neck, breast, belly, and thighs tinged with rose-colour; under tail-coverts white; legs pale red; claws brown.

This bird is frequent at Malacca and the island of St. Helena; and is also found, according to Jacquin, in South America.

Suratensis. Griseous; neck above black; hind head white; nape banded with rufous; quill-leathers black; back, rump, and tail obscur grey. Columba suratensis, Gmel. La tourterelle de Surate, Sonner.

About ten inches in length. The bill is black; the irides and legs red. It is a native of Surat in the East Indies.

Cambayensis. Grey, beneath white; head somewhat vinaceous; collor beneath black, varied with rufous; lateral tail-feathers half black and half grey. Columba cambayensis, Gmel. La tourterelle grise de Surate, Sonner. Cambayan turtle, Lath.

Described after Sonnerat as a native of Surat, and other provinces of Cambay. Its size is that of the collared turtle.


The length of this bird is seven inches and three quarters. The bill is red; fore part of the head and throat ash-colour; the hind head and back part of the neck, back, rump, upper tail and wing-coverts, breast, belly, fides, and thighs green gold, gloffed with copper; the greater wing-coverts have the outer edges of the feathers at the tip fulphor-coloured; under wing-coverts ash, quills blackish; tail blue-green, gloffed with copper; the legs are red, and covered half their length with feathers; the claws grey-brown. This bird inhabits Ambouna.


A species the size of the last, and also described by Sonnerat. It inhabits the coast of Malabar. The bill and nides are red; the head, back, and wings are of a pale cinereous-grey; the neck and breast grey, tinged with vinaceous; the two middle tail-feathers grey; the belly white; and legs red.

Melanoccephala. Green; head somewhat cinereous; head blueish-ash; hind head black; chin and throat yellow; vent orange; six middle-tail-feathers green; the outer ones on each side fine crimson. *Columba melanoccephala*, Zool. Ind. *Turve, Buff. La tourterelle de Bataua, Pl. Enl. Black-capped pigeon*, Ind. Zool.

Found in the island of Java. The length is nine inches and a half; the bill black, short, and yellow at the tip; the tail is of a somewhat cuneated form; and the legs are black.


Length nine inches; the bill pale red; covered with a white cere; tail dusky beneath; legs red. Inhabits Java.


Size of the last; it is an inhabitant of China, where it is called by the natives *Taiyuan*. Common also in the island of Cuba, where it is caught in traps, and brought to the markets in great numbers as an article of provision.


The length of this bird is eight inches. The bill is reddish; top of the head ash-coloured; hind part of the neck, back, wing-coverts, and rump grey-brown; throat whitish; fore part of the neck and breast pale vinaceous; the belly, fides, thighs, and under tail-coverts dirty white; the upper tail-coverts are grey-brown, with the tips blackish; quills brown, with the inner webs rufous; on the wings are some spots of green gold-colour, gloffed with violet; the tail is two inches and three quarters in length; the two middle tail-feathers blackish brown, the rest grey-brown, with the ends blackish; the legs are red, with brown claws. This is a native of Senegal, and is the *Columba senegalensis* of Drifon, but not of Linneus; the latter writer describes the next species under that name.


The length of this species is nearly ten inches; the bill is blackish, the head, neck, and breast vinaceous; upper part of the back brown, lower cinereous; the fix middle feathers cinereous brown; the three others on each side dark-ash from the base to the middle, and from thence to the ends white; beneath the colours are all ash, and half black in the fix middle feathers, and white in the three outer ones; the legs are red, the claws brown. This bird is found chiefly near the river Senegal.


Size of the last, and inhabits the same country. The bill is blackish; head, neck, and breast sharct-colour; upper part of the back brown, lower cinereous; belly white; fix middle tail-feathers ash-coloured-brown; beneath from the base to the middle black, the rest cinereous.


First described by Sonnerat; it inhabits Manilla. The length of this bird is eight inches; the bill is black; the irides fuscous; collar on the neck violet, gloffed with green; the blood-coloured spot on the breast darkish in the middle; wings with three grey and two black transverse bands; quill feathers black; tail grey at the base, and black at the end; legs blackish; and somewhat violet.


This bird inhabits Manilla, and was first described by Sonnerat. It is a species of great singularity, the whole of the plumage being white, except the spot on the breast, which is of a deep tanguineous colour; the bill and legs are red, the irides purplish.


The ground dove is a native of the warmer parts of America, and the contiguous islands; and is observed as far north as Carolina, but more rarely. Wilughby says it is very common in Mexico, where it inhabits mountainous places. Dancroft observes, that it is the only kind of dove met with at Guiana. In the Caribbean islands it is very abundant, and is commonly eaten, being in much esteem for food; its haunts are lony places under bushes. It is also common in Jamaica, where, as Sloane mentions, "they feed on the ground like partridges, and spring as they do, rising and flying for a short flight, and then light again on the ground." They subsist chiefly on grain and seeds of vegetables; and are taken in traps baited with the seeds of the *Ricinus*, or castor oil.

This is a small and elegant species, the length about six inches. The bill is pale red, with the tip blackish; the irides orange; upper part of the head and neck ash-colour; back, rump, and upper tail-coverts the same, but deeper; front vinaceous; throat and breast spotted with brown; two middle tail-feathers are deep ash-colour; the others blackish; legs
legs red, the claws blackish. The female differs in the general colour of the plumage being paler.

There are several varieties of this species, one of which, found at Carthagena in South America, is distinguished by having fewer brown spots than usual; another has the body more inclining to reddish, and the eyes chestnut; and a third with the feathers of the neck and breast of many colours.

**MINUTA.** Brown ; wings with from five to seven rivel-blue spots; outermost tail-feathers white at the tip. Columba minut, Linn. Turto pavus fusius americanus, Briss. Cecidin alid genus, lapaleoecil, Will. Paffiere turtle, Lath.

It admits of some doubt whether this pigeon is distinct from the last, C. paffiera. This kind inhabits America, and is five inches and a half in length. The upper parts of the body are brown, the under more or less rufous-white; wing-coverts rufous; two middle tail-feathers brown, the others ash-coloured at the base, black in the middle, and brown at the tip; the bill and legs are black.

**MALACCENSIS.** Undulated with black lines; above cinereous-grey; beneath cinereous; sides of the neck white; tail-feathers fuscous, fides near the tips white. Columba malaccenis, Gmel. La petite tourterelle de queuda, Sonner. Malacca turtle, Lath.

This is a beautiful species, scarcely exceeding the size of the common hoopoe-sparrow; the bill is yellow, and in the middle black; the forehead and throat are light cinereous-grey; breast and belly vinaceous-grey; middle tail-feathers brown for two-thirds of their length, and from thence to the end white; thighs and under tail-coverts white; legs yellow. This species inhabits Malaca, and is esteemed a delicacy for the table.

**VERNANS.** Green; beneath yellowish; outer edges of the wings pale yellow. Columba viridavisphilippines, Briss. Pigeon vert des philippines, Buff. Columba vernanas, Gmel. A native of the Philippine islands; the bill and legs are red, the breast azure.


Those birds inhabit North America, passing the summer in the higher latitudes, and retiring to the more southern provinces at the approach of winter. They build in trees, and lay two eggs. It is said those pigeons are so abundant in America, that at the period of their migration they are seen passing from one place to another in flocks of two or three miles in length, and a quarter of a mile in breadth, and which literally darken the air as they proceed. Frequently at such times we are told they alight on trees, and sometimes in such immense numbers as to break down pretty strong branches. They are said to eat excellent eating, and, during the time of migration, furnish the common people of America with abundance of food. About Philadelphia they flock to these birds from the tops of their houses, or knock them down in the evening from their roosting places. In Louisiana they adopt another mode of capture; a party of five or six go in the evening into the woods, and taking with them several ditches, or other flat vessels, they let a brace on fire in these under such trees as the birds commonly prefer to roost upon, the smoke and vapour of which ascend to fluster the birds that they drop down from their roosting places, and are picked up and secured in flocks previously provided for that purpose. It is said fences parties are often accompanied in those nocturnal rambles by the ladies; this mode of taking pigeons being esteemed a delightful evening's amusement. The chief food of these birds are acorns, rice, corn, and other grain.

The passenger, or migratory pigeon of America, is about the size of the common domestic pigeon of this country. The bill is black, the space round the eyes crimson; irides orange; head, throat, and hind part of the neck, back, rump, and upper tail-coverts cinereous; wing-coverts the same, marked with dusky or black spots; the sides of the neck are glazy, variable purple; fore part of the neck vinaceous; belly, sides, and thighs, with the under tail-coverts, the same colour; paier, quills black brown, edged with white; the tail rather long, with the two middle feathers blackish brown, the ruf hoary; legs red, with black claws.

A variety of this species is described by Gmelin. The colour is brownish above, beneath whitish-rufous; neck on the forepart somewhat vinaceous; lateral tail-feathers with a round black spot in the middle on the upper surface.


Rather larger than the common turtle. The bill is blackish; irides black; front, throat, and breast rufous, with a green-gold and violet gloss. The hind part of the head and neck are brownish ash; the back, rump, upper tail, and wing-coverts ash-brown; on the wings, near the tip of the greater coverts, are a few black spots; quills blackish ash with whitish edges; tail-feathers unequal, the two middle ones four inches and an half in length; the outer ones very short; the two middle ones entirely ash-coloured; the next two on each side ash-coloured, marked with black in the middle, the others light ash-colour, whitish at the end, with a black spot between the two colours; the legs are red, the claws black. The female is destitute of the glossy violet colour on the breast. Those birds inhabit Carolina, Brasil, and St. Domingo.


Length thirteen inches; the bill blackish; upper part of the head, neck, back, and wings grey-brown; the lower part of the back, rump, and upper tail-coverts ash-coloured; throat and fore part of the neck grey-brown tinged with yellowish; wing-coverts marked with blackish brown spots; tail ash-coloured, the feathers tipped with white, except the two middle ones; legs red; claws black. In the female most of the feathers are tipped with dirty white, which gives the plumage a struck appearance. The native place is Canada.

**MARGINATA.** Body above fulvous; beneath brownish-grey; breast red; tail feathers black at the tip, the edges white. Columba marginata, Linn. Turtur Americanus, Briss. Tourterelle d'Amérique, Buff. Long taillé, Duf. Margined pigeon, Isth.

Inhabits America. Length ten inches; the bill is hoary; irides rufous; lores white; front and chin reddish brown; bird head blueish ash; under the ears a black spot; upper part of the body brown; shoulders spotted with black; throat rufous; two middle tail feathers blackish, the rest cinereous.

**AMBIGNENSIS.** Body rufous; neck waved with black. Columba ambignensis, Linn. La tourterelle d'Ambot, Buff. Ambina turtle, Lath.

Length fourteen inches; bill black; feathers of the crown,
crown, neck, and breast with a blackish transverse bar near the tip; feathers of the upper part of the back, and wing-coverts brown tipped with rufous; wings brown; tail reddish-brown. A native of Ambona.

*Capeensis.* Body grey-brown, beneath white; primary quill feathers rufous on the inside. *Columba capensis,* Linn. La tourterelle, Buff. Cape pigeon, Lath.

Inhabits the southern parts of Africa. The length of this bird is nine inches and a half; the bill is red; body grey-brown; belly whitish; spot on the wing fleshy; secondary quill feathers brown, with the exterior edge grey; tail black beneath; lateral feathers at the base grey-brown, with the tips blackish; legs red, with the claws black. The female differs in having the throat and forepart of the neck of the same colour as the ruf of the head, and the greater wing-coverts not tipped with black. There are several varieties of the Cape pigeon.


The length of this bird is twelve inches, the bill red, with a white cere; tail as long as the body; legs red. A native of Senegal.

*Bantamensis.* Orbits naked and fleshy coloured; neck, breast, and flanks waved with black and white. *Columba bantamensis,* Mül. Curt. f. 3. t. 67.

Common in the island of Java. The species is small, bearing about the size of the wry neck; the bill is black; body above hoary ash; beneath whitish; back, wings, and breast with lunate black spots; tail fame length as the body, and confining of fourteen feathers, the fix middle of which are black, the rest white towards the tip; legs red.


*Dominicensis.* Body grey; sides of the head and collar beneath the nap white; spot on the crown; band under the eyes, and collar on the neck black. *Tourterelle de St. Domingo,* Pl. Enl. Columba dominicensis, Lath. Ind. Orn.

A native of St. Domingo; the length of this bird is eleven inches; the bill black; wings with a few blackish spots; breast vinaceous; front, chin, and vent white; tail grey; the outermost feathers white; legs red.

*Columba raisoniaca,* a name given by authors, as Ray, Willughby, and Albin, to the black guilemot. See Cololumbus girile.

Columba is also the name of a military order instituted by John I. of Calilé, about the year 1739.

*Columba Novatie,* a small constillation in the southern hemisphere, consisting of ten stars. The longitudes, latitudes, &c. of which are given in Sharp's Catalogue.

Columbace denotes that part of the agallochum, which is between the heart, and that part next to the bark.

*Columbaria,* in Ancient Geography, an island of the Mediterranean on the coast of Etruria, according to Pliny.—Also, another island of the Mediterranean, near Drapanum in Sicily, called by the Greeks "Pelias."

Columbarium, a promontory of the Isle of Sardinia, N. of Portu Olbians, on. the E. coast: the same with Colymbium.

*Columbate of iron.* See Columbium.

Columbia, a county of America, in New York, bounded N. by Rensselaer, S. by Dutchess, E. by the State of Massachusetts, and W. by Hudson river, which divides it from the county of Albany. It is 32 miles long and 21 broad, and is divided into 6 towns, viz. of which Hudson, Claverack, and Kinderhook are the chief. It contained, in 1793, 27,732 inhabitants, and in 1796, 35,560 electors.

*Columbia,* a county of America, in the upper district of Georgia. bounded by the Savannah river on the E. and N., which separates it from the State of Carolina, and N.W. of Richmond county.

*Columbia,* a township of Washington county, in the district of Maine, on Penobscot river, adjoining Machias on the N.E., was incorporated in 1796.

*Columbia,* a poll-town of America, the capital of Kansas county, and the seat of government of S. Carolina. It is situated in Camden district, on the S. side of the Congaree river, just below the confluence of Saluda and Broad rivers. The streets are regular, and the town contains upwards of 70 houses. It lies 115 miles N.N.W. of Charleston, 35 S.W. of Camden, and 678 S.W. of Philadelphia. N. lat. 34° 15'. W. long 81° 57'.

*Columbia,* a flourishing town of Georgia county in the State of Virginia, on the side of James river, near its junction with the Rivanna, 45 miles from Richmond, and 35 miles from Charlotteville.

*Columbiana,* a town of America, in the county of Lancaster and state of Pennsylvania, seated on the N.E. bank of the Susquehanna river, 10 miles from Lancaster, and 76 W. by N. from Philadelphia.

*Columbia,* a town of America, in the county of Hamilton and State of Ohio, seated at the confluence of the Little Miami with the Ohio, 6 miles above Cincinnati. The settlement began in 1789. N. lat. 39° 20'.

*Columbiana College.* See College.

*Columbiana county.* See Washington.

*Columbiana,* a county of America, in the state of Ohio, bounded N. on the county of Trumbull, S. on Jefferson and Muskingum counties, E. on the state of Pennsylvania, and W. on the Muskingum river, and county.

*Columbic Acid.* in Chemistry. See Columbium.

*Columbiars,* in Geography, a town of France, in the department of the Aisne, and district of Rhodes; 10 miles W. of it.

*Columbina,* a name given by Aetius, and some other medical writers, to the verbena, or common vervain.

*Columbina Marga.* See Marle.

*Columbine,* in Botany. See Aquilegia.

*Columbine feathered.* See Thalictrum aquilegifo- lium.

*Columbine,* a kind of violet-colour, called also dove-colour. See Dyeing.

*Columbium,* in Chemistry, a new metal discovered by Mr. Hatchett, in the year 1802, in a mineral which he had from the British Museum. The mineral, it appears, had been fet with some specimens of iron ores from Massachusetts in America, to Sir Hans Sloane, in whose catalogue it is described as "a very heavy black stone, with golden streaks." By Mr. Hatchett it is described as of a dark brownish grey externally, and more inclining to an iron grey internally; it found the longitudinal fracture lamellated; and the transverse fracture had a fine grain. Its luster is vitreous, slightly inclining in some parts to metallic, moderately hard, and very brittle. The colour of the powder was dark chocolate brown; but the streaks were yellow mica. The particles were not attracted by the magnet. Its specific gravity, at the temperature of 65°,
COLUMBO, in Geography, the capital of the island of Ceylon, and the seat of government. It is situated on the S. W. part of the island, in about 7° N. lat., and 85° E. long., from London. It was captured from the Dutch by the British troops under General Sir Harry in 1756. A tough Trincomali, on account of its situation and history, is of greater consequence to the British nation to retain, yet Colombo is in every respect greatly superior. The number of its inhabitants is much greater; its fort and black town are much larger; the country in which it is situated much more fertile; and the rich district depending upon it much wider, being not less than 50 leagues in length and 10 in breadth. Colombo is commonly supposed to have been first fortified by the Portuguese; but Captain Percival questions the truth of this statement, as Laurence de Almeida, after his first treaty with the king of the island, found that the Moors and Malabars had a fortress here, on which some guns were planted, which had been procured from ships wrecked on this coast. That part of the fort, where these ancient works stood, is now strongly fortified, and shown as the first works of the Portuguese. It is in a manner detached from the main body of the fort, being separated from it by an entrenchment and wall, with a fosse or ditch, now almost choked up. The fortress was built on a precipitous loft, projecting into the sea, and it is thus exposed on all sides to the sea breezes, by which the air is rendered temperate and healthy, though it lies so very near the equator. This fort is upwards of a mile in circumference; and is indebted for its strength both to nature and art. On the south side the fort runs to high, and the shore is so rocky, that it would be dangerous to approach it. On the west side of the bay, where the sea is smoother, and near the wharf or landing place, which at all seasons of the year is safe for boats, the only attempt could be made; but these quarters are so well defended by the batteries which command the harbour, that there is hardly any probability of its succeeding. On the west side of the fort, and facing the sea, are two very fine batteries, **en barbet**, intended for the security of the harbour. These stand on a part that projects a considerable way from the main body of the fort, from which they are separated by a high wall and ditch flank'd with bastions, and have gates that communicate with the interior of the fort. Here the wharf or landing place is found; it consists of large piles of timber, extending several yards into the sea, and affords a very commodious station for loading and unloading ships and large boats, which may be brought close alongside. At this end several store-houses, and barracks for half a regiment are erected. The ramparts of the fort are very strong, having eight principal bastions; and they have also a number of lesser ones, with curtains, bastions, and parapets, communicating with each other all round the fort, and fitted for troops to march and defend with musketry and field-pieces. The whole fort is surrounded by a road and deep oval ditch, over which draw-bridges are thrown at each of the gates. On the outside are some small magazines, with a powder-mill and a saw-mill attached to the fort. Adjoining to the covert-way, and at the foot of the plain, is a lake extending three or four miles into the country, in a N. E. direction. For near a mile on the outside of the fort, the neck of land which connects it with the country, is not above five or six hundred yards wide; and in the middle of this space lies the lake, leaving room on each side only for a narrow cauleway. Near the plain an approach might be entirely cut off, by opening the sluices and cutting the road across, where the lake would be connected with the sea, and the garrison completely isolated.

In the centre of the lake is an island, communicating with it...
a fully-port on the east face, by a narrow causeway and draw-bridges. This is a pleasant spot, abounding with cocoa-nut trees, and was called by the Dutch "Slave Island," as it was the place whither they sent their sick slaves. A battalion of Malays is stationed here. This island is very convenient, as it lies contiguous to the fort, and opens the nearest way to the cinnamon gardens, which are close by it. The fort has three gates; the principal one, where the main-guard is stationed, which is called the Delphgate, and leads into the "pettah," or black town. It has two draw-bridges to pass over the ditch, which here forms an angle. At each of the gates are guard-houses, with a subaltern's guard placed over them.

The plan of Columbo is regular. It is nearly divided into four equal quarters, by two principal streets, which cross each other, and extend the whole length of the town. To these smaller ones run parallel, with connecting lanes between them. At the foot of the ramps, in the inside, is a broad fleet or way, which goes round the whole fort, and communicates with the battions and soldiers' barracks; and also affords, at the different angles, open spaces for their private parading. The grand parade is by no means sufficient for the garrison, as it can hardly contain one complete regiment. On one side of it are ranges of public offices for the civil and military departments, with the town or flad-houfe in the centre of them, where the Dutch held their high court of justice. On the arrival of the British troops they found a rack, wheel, and many other implements of torture, which had been used for inflicting punishment on criminals, particularly slaves, but these savage modes of punishment were immediately abolished by the British government. On the other side of the grand parade stand the cinnamon store-houses, or "go-downs," as they are here called. At the upper end of the parade the Dutch had begun to erect a church, which has never been finished. The Dutch usually attended divine service at a spacious and handsome church in the black town, about a mile distant from the fort; and worship is still performed there for the English, either before or after that of the Dutch inhabitants. The government house, which faces the harbour, is a very long and capacious building, but more convenient than elegant: several offices are attached to it, where the buxoms of government is transfixed. Behind it is an excellent garden, intended for a "tank" or reservoir, in case of a siege; for though every house has a well plentifully supplied with water through the year, yet it is of a brackish quality, and not fit to drink. The Europeans, therefore, both of the civil and military establishment, are supplied with water from a spring, about a mile from the fort, which is brought by means of barrels, in leather bags, called here "puckally bags," a certain number of which is attached to every regiment and garrison in India.

Columbo is built more in the European style than any other garrison in India. The interior of the fort has also more the appearance of a regular town; the Dutch houses are all regularly built, though few are above one storey high; and the windows have all glase-panes, after the European manner. Before each house, and connected with it, is a large open space, roofed in and supported on pillars of wood, called a "viranda," affording a shade from the sun, and exposure to the refreshing breeze of the sea. The houses are also agreeably shaded by a double row of thick foregoing trees, planted on each side of the several streets. The walls of the houses are plastered over and white-washed with a very bright lime, made of burnt shells. This beautifully white colour may contribute to the coolness of the houses, but it throws an unsupportable glare on the eyes of the passengers along the streets. The houses are for the most part uniformly constructed, consisting of the hall in the front, with a chamber at each side, and another room in the back part, equal in length to the other three, and called the "back viranda." Behind this are one or two ranges of small buildings, proportioned to the size of the house and designed for the accommodation of servants, for cells, and sometimes for sleeping rooms. The houses are covered with indented tiles, which afford no security against rain. In the centre of the principal street is a very handsome and lofty house, which belonged to the Dutch governor, and has since been occupied by the commander of the British forces on the Island. It serves as a convenient house for the commandant of the garrisons, with suitable offices and gardens. The hospital, detached or isolated and small, is a roomy and convenient building. Three or four battalions are usually stationed as a garrison in the fort of Columbo.

The harbour of Columbo, which lies on the west side, is an open road. Borrowing good and safe anchorage to ships for only four months of the year, from December to April, when the N.W. winds do not prevail, to any great degree; but about May, when the monsoon sets in on the Malabar coast, and extends its ravages to the west coast of Ceylon, the roads of Columbo no longer afford any protection. Hence it is, that Columbo is cut off from any intercourse by fra, with the other parts of the island, for two thirds of the year. For six months of the stormy season, this side of the island is subject to very heavy falls of rain, accompanied with dreadful thunder and lightning, and violent winds blowing in there. During this season the variations of the climate are very great. The heavy rains, predominating most by night, render the air damp and cold; and the excessive heat of the sun by day is almost intolerable. These transitions make the climate more unhealthy at this season than during the hot weather. During the rainy season, the Indians from the continent are very few to fluxes, dysenteries, and fevers. They are also subject to another very extraordinary disease, called the "Berry berry," occasioned by low diet and hard water, which swells the body and legs of the patient to an enormous size, and generally carries him off in twenty-four hours. The cure is effected by rubbing the disfigured person all over with cow-dung, oil, cinamon, lime juice, and other preparations from herbs, and then burying him up to the chin in hot sand. The British soldiers counteract the bad effects of the air and water, by drinking plentifully of arrack and smoking tobacco. The "Pettah," or black town, of Columbo deserves particular notice, on account of its extent and superior structure, compared with other fine towns attached to the forts of India. It is divided into two parts: that nearest the fort consists of one very large street, beginning at the esplanade near the walls, and running on till stopped by an old mud wall, and a gate called the "Kenman's port." In this division of the Pettah are most excellent houses, where many Dutch gentlemen and merchants reside. Through Kenman's port there is a narrow passage leading into the other division, which consists of a long straggling town, skirted on one side by the lake above described. Besides a principal street, there are several smaller ones running parallel to it, in one of which is a large well-constructed building, called the "Orphan Seminary, or School," where the Dutch used to educate the children of their soldiers and the poorer Europeans, as well as those they had by the native women. Here the boys were educated at the public expense, till they were fit for trades, and afterwards settled in some comfortable situation, or married to persons of their own rank. This laudable institution is still maintained by the
the British government. Close by the esplanade, and adjoining the black town, is the burial ground of the garrison. The shops, bazaars, and stalls, placed all along the streets, are replenished with various articles of merchandise, peculiarly in use among the natives of India; and the town, during the whole day, swarms with people of all descriptions. The boats or canoes used in the fisheries of Colombo are of a curious shape and construction. They are about fifteen feet long, and not more than two in breadth. They move with great speed, especially with the addition of a very large square sail; and, to prevent their over-flogging, a log of wood is extended five or six feet from the end of the boat, by way of out-rigger; this log is fastened to the boat by two long and bent poles, and seems to serve at once for helm and ballast. A paddle, somewhat in the form of a shovel, is used to guide the boat's head. The body of the canoe is a large hollowed out fire, or looped over by the carpenters. Along its sides boards are nailed to the height of about two feet, and in the form of a gun-wale, to prevent the water from getting in. When large burdens are to be carried inland by the canals or rivers, two or three of these canoes are lashed together without the out-riggers. Split-out, banana, bocce, or hotel trees, are then laid across them, in so as to form a kind of raft; which, though ever so much loaded, will draw but very little water. Other flat-bottomed boats of a much greater breadth are also used by the natives. These are thatched with coco넛-tree leaves, like a house, and are large enough to hold couches. Near Colombo may be seen two or three hundred of these boats in regular rows, moored along the banks of the rivers, with entire families on board, who make them their habitations.

Colombo, for its size, is one of the most populous places in India; and its population consists of a great variety of nations. Besides Europeans and Cingalese, the proper natives of the island, you meet, scattered over the town, almost every race of Asiatics; Moors of every clafs, Malabars, Travancorians, Malays, Hindoo's, Goons, Chinese, Parsees, Arabians, Turks, Maldivians, Javans, and natives of all the Asiatic isles; Perfoes, or woodhoppers of fire, who would rather have their houses burnt, and themselves perish in the flames, than employ any means to extinguish it. Here are also a number of Africans, Cafirnens, Bugneges, or a mixed race of Africans and Asiatics; both the half-casts, people of colour, and other races which proceed from a mixture of the original ones. Each of these different classes of people has its own manners, customs, and language. The language is not generally spoken by both the Europeans and Asiatics, who refer to Colombo is the Portuguese of India, a base, corrupt dialect, altogether different from that spoken in Portugal.

Colombo, though difficult of access, is situated in a rich district, and furnishes a great variety of articles to commerce; and, therefore, it is much frequented both by Europeans and the natives of the different coasts of India. From this district large quantities of cinnamon and pepper, the staple spices of the island, are yearly transported to Europe in vessels that touch here on their voyage from Madras and Bengal. A great quantity of arrack is made in the neighbourhood of Colombo and the other districts along the west coast. A large quantity of Cova rope, or cordage is also manufactured here, for the supply of our ships on the various stations in these seas. The inferior articles, exported by the Moors and Malabars, who refine here for that purpose, are betel-leaf and arca-nut, jaggery, or a sort of coarse blackish sugar, cocoa-nut, and oil, honey, bees-wax, cardamoms, coral, ivory, fruit, and a variety of other smaller articles. In return they import coarse woolen cloths, and calicoes, pieces of printed or painted cloths for women's apparel, coarse muffins, handkerchiefs, palampores, flodkings, china-ware, tin, copper, and a variety of toys; also bonellies, a species of fish peculiar to Bombay, and onions, from the same place, where they are remarkably good. Every year, generally towards February, a Portuguese or Cingalese ship arrives from Macao with tea, sugar, candied sweetmeats, hams, silks, velvets, nankeens, umbrellas, straw-hats, all kinds of china-ware and toys; all which articles find a very ready sale, and are paid for in hard cash. The current coin at Colombo, as well as in the other European dominions on the island, is the peice, of rix-dollars, a nominal coin, like one pound Sterling, valued at a certain quantity of copper money. There were besides several small copper coins, called pice or rivers, half-piece, and duides. Four pice or two duides made a fanny, and feven fanams were equal to a rix-dollar. New regulations have been adopted with regard to the coin since the island has belonged to the English. This rix-dollar is worth eight shillings sterling; and the fluctuation of the value of money in Ceylon is very great, and depends upon the plenty and scarcity of gold and silver there. The expence of coming at Colombo is more considerable than on the continent of India. Horses and servants are particularly expensive, vegetables are extremely scarce, and they form a great article of food in those warm climates. Such articles, however, as are the native produce of the island, are found in great abundance, and at a moderate price. Beef, fish, and fowl, in particular, are both cheap and plentiful. Mutton is excessively dear, as no sheep can be reared in the neighbourhood of Colombo, which some attribute to the noxious fumes of the climate or produce of the island, but which may be principally owing to their failing an easy prey to jackals, snakes, and other destructive animals, and also to certain poisonous herbs that occur in many places. Pigs and ducks are plentiful and cheap. Geese are rare, and turkeys are not to be had, except occasionally by importation from other parts of India.

The country round Colombo for several miles is flat and very rich. It is diversified with fields of rice and paddy, as well as a variety of gardens, in which the cocoa-tree is conspicuous. The scene is embellished by a number of small rivers, lakes, and canals. The sandy roads, which everywhere intersect the country, afford to the traveller an agreeable shelter; while the numerous country feasts and gardens which skirt them present his eye with a continual change of gratification. The river Mutawai extends itself here into a very broad channel, and by its numerous windings affords a most enchanting prospect from the road, which runs along its banks for many miles. Several temples of the natives are situated along the banks of this river and among the adjoining groves. One of the chieft-beauties in the vicinity of Colombo is the immense number of cinnamon trees, which produce the niceties of the island. In the woods they grow wild in abundance, and in the gardens they are now regularly cultivated with the greatest success. Painvil's Account of the Island of Ceylon, 1805.

Colombo, in the Materia Medica. This root was first brought from the town of Colombo, in the island of Ceylon.
in which country it had long been used as a valuable rem
dy in bilious fevers, and other disorders of the stomach and
bowels. Our practitioners in the East Indies adopted the
use of this root from China, and it is now deservedly in high
reputation in most parts of Europe. The plant that yields it
is not commonly known.

Columbo root comes to us in circular pieces about two
inches in diameter, covered with a thick wrinkled bark of
a dark brown externally, but a light yellow within. On
paring off this bark the root is seen to consist of three distinct
families. The whole is used indiscriminately in medicine.

Columbo root has an aromatic smell; the taste is better
and more nauseous. It gives no essential oil when distilled
with water, and contains fiercely any volatile aromatic parts.
When boiling water is poured on the powdered root a
strong infusion is produced, which possesses all the feebile qua-
lities and virtues of the plant, but it grows mouldy in a
day or two. Spirit of wine also extracts the active qualities
of this root very readily.

Columbo is employed with nearly equal advantage in sub-
flance in spirituous tincture or in watery infusion, and gen-
erally with the addition of cinnamon or some grateful aro-
matic. The latter is of singular efficacy in strengthening the
fibres of the stomach and bowels, either in chronic cases, or
more particularly in cholera morbus, dysentery, and other
violent disorders of the alimentary canal, where, after due
evacuations, it may be employed with great success in check-
ing the incessant vomiting action of the bowels that bring
down the powers of life with such rapidity.

An extract and a tincture of Columbo are kept in the
shops, the latter of which is by itself a very useful stomachic
taken daily in very small doses.

COLUMBUS, CHRISTOPHER, in Biography, a subject
of the republic of Genoa, celebrated in history as the disco-
verer of America. Neither the exact time nor place of his
birth can be ascertained with any degree of certainty, but
it is generally supposed that he was born in some part of
the Genoese dominions about the year 1447. He is said
to have been descended from an honourable family, reduced
by various misfortunes to a state of indigence. In whatever
rank of society his parents moved, it is certain that they
gave their son an education adapted to the bent of his ge-
nius; at school he acquired the elements of the Latin lan-
guage, and made some proficiency in geometry and the other
sciences which he was enabled in the future part of his life,
to apply to the practical parts of navigation. At the age of
fourteen he went to sea, and though his first voyages were
confined to the Mediterranean, yet he very soon ventured out on
the northern seas, and visited the coasts of Iceland, to which
the English and other nations referred on account of its
fishery. About the year 1467 he entered into the service of
a sea captain of his own name and family, and spent some
years in a predatory warfare against the Mahometans and
Venetians the rivals of his country in trade. In this situa-
tion he continued acquiring both wealth and reputation, till
at length in an obstinate engagement with some Venetian
vessels, off the coast of Portugal, the ship in which he served
took fire, and his, with difficulty, preserved him by throwing
himself into the sea, and swimming a distance of two
leagues to the shore. As soon as he had recovered strength
for the journey he repaired to Lisbon, where his brother
Bartolomew had settled, and where he found many of his
countrymen, who, like himself, had embarked in the sea ser-
vice. Here his merit and talents were soon appreciated;
and here he married the daughter of Pereiré, one of the
captains employed by prince Henry in his early navigations,
and who, under his protection, had discovered and planted
the islets of Porto Santo, and Madeira. Columbus got
possession of the journals and charts of this experienced na-
vigator, and from them he learned the course which the
Portuguese had held in making their discoveries, as well as
the various circumstances which guided and encouraged
them in their attempts. While he contemplated the labours
of his father-in-law, and read the description of the countries
which he had seen, his own impatience to visit them became
irresistible. To indulge it he made a voyage to Madeira,
and for several years traded with that island, with the Can-
aries, the Azores, the settlements in Guinea, and all other
places which the Portuguese had discovered on the conti-
nent of Africa. He now began to think of extending the
boundaries of nautical knowledge. He was satisfied, not
only that there must be lands still further to the west, than
those already explored, but that a shorter passage to the
East Indies, then the great object of the Portuguese naviga-
tors, might be found by steering in that direction, than
round the continent of Africa. When he had settled his
plan, he was anxious to secure the patronage and support of
some European power capable of undertaking so important
a project. With this view, he laid his scheme before the senate of Genoa, and, making his country,
for which he bore a filial and sincere affection, the brit
of tender of his service, offered to sail under the banners of
that republic, in quest of new regions, which he expected
would render illustrious his own name, and the nation which
should enable him to realize his vast projects. Genoa re-
jected his offer: and Portugal, to whom he next applied,
treated him with so much duplicity, that he went himself
spain, while at the same time he sent his brother Bar-
tholomew into England to make the like proposals to both
counts. By both, his schemes were at first slighted, till, by
the interposition of some zealous friends at the court of
Spain, a change was effected in his favour, and in the spring
of 1472 a treaty was signed with Columbus, by which Fer-
dinand and Isabella, the sovereigns of Spain, appointed him
their high admiral in all the seas he should discover, and
their viceroy in all the islands and continents. They
granted him and his heirs a tenth of all the profits that
should accrue from the enterprise, with some other important
advantages. As soon as the treaty was signed, Isabella,
by her activity and attention, in forwarding the preparations
for the voyage, endeavoured to make some preparation to Co-
lumbus for the time which he had lost in fruitless solicita-
tions.

On the third of August 1492, Columbus set sail with
three small ships and ninety men. The expense of which did
not amount to more than 4000l. He had already, in the most
public manner, implored the guidance and protection of heaven,
and on the morning of his departure the vessels were crowd-
ed with spectators, who sent up their supplications to the
Almighty for the prosperous issue of the voyage. Colum-
bus proceeded directly for the Canaries, where, on account
of the ill condition of the ships, he was obliged to ret
Having supplied himself with fresh provisions, he sailed from
Gomera, one of the most westerly of the Canary islands, on
the sixth day of September. Here the voyage of discovery
may be said to begin; for Columbus holding his course due
well, left immediately the usual track of navigation, over a
vast and unknown ocean, with no other guide, than well-
founded hopes and rational conjectures. Scarcely had he
lost sight of the Canaries, when several of his men ex-
hibited signs of consternation bordering on despair. He
comforted them with the vail wealth which was to be found
in those regions, whether he was conducting them, and in his
own person he flet such an example of patience and industry
COLUMBUS.

as could not fail of exciting the admiration of those about him. Scarcely did he allow himself time for necessary refreshments; he regulated every thing; he superintended the execution of every order, and kept the deck with the founding line or instrument for observation perpetually in his hand, and noting down every unusual appearance with the utmost accuracy and precision. Three weeks had they traversed the ocean, and had proceeded to a distance which Columbus thought it prudent to conceal, when his men became mutinous, and even threatened to throw their admiral overboard should he persist in an undertaking which they supposed must prove fatal to them all. He succeeded for the present in quieting their apprehensions, but in a few days they became more violent, declaring that nothing should induce them to proceed in so mad an enterprise; after trying every means of persuasion in vain, he at length promised to direct his course homewards within three days, should not land be discovered. This proposition did not appear unreasonable to the men, and to the commander it appeared sufficiently safe, for the prelages of discovering land by the flight of birds, &c. were now so numerous and promising that he deemed them infallible. From a variety of symptoms it was most certain that they were in a land near hand, that on the evening of the 17th of October, after the usual invocations to heaven for success, he ordered the sails to be furled, and the slings to be cast, keeping the 新boat watch, lest they should be driven on shore. During this interval of suspense and expectation, no man left his eyes, all kept upon deck, gazing intently towards that quarter where land was expected to be discovered. At ten o'clock Columbus, standing on the forecastle, observed a light at a distance: he pointed it out to another, and he again to a third person; all three saw it in motion, and at midnight there was heard from the forecastle vixel the joyful sound of land, land. Having, however, been frequently deceived by false appearances, every man was flow of belief; and waited in all the anguish of uncertainty and impatience for the return of day. When the morning dawned their doubts were dispelled, and an island was seen about two leagues to the north, white verdant fields, well flored with wood, and watered with many rivulets presented the aspect of a delightful country. Thanksgiving were instantly offered to heaven: never was gratitude more sincere, never were the expessions of joy more ardent, than those which proceeded from every tongue. Their duty to God was followed by an act of justice to their commander. They threw themselves at the feet of Columbus, with feelings of self-condemnation, mingled with reverence entreating pardon for their past conduct; and now they regarded as the favourite of heaven the man whom they lately reviled as a visionary and impostor. No sooner had the fun tinged with its rays the shores of the newly discovered island, than their boats were manned and armed. As they approached the coast with colours, music, and martial grandeur, they saw it covered with a multitude of people, whom the novelty of the spectacle had drawn together, whose attitudes and gestures expressed wonder and astonish ment at the strange objects which presented themselves to their view. The land proved to be one of the Bahama islands, named afterwards by Columbus, San Salvador: he was the first European who set foot in the New World which he had discovered, and he took solemn possession of it for the crown of Castile and Leon, with all the formalities which the Portuguese were accustomed to observe in acts of this kind, in their new discoveries. The Spaniards, while thus employed, were surrounded by many innocent and unsuspecting natives, who gazed in silent and awful admiration upon actions which they could not comprehend, and of which they could not foresee the direful consequences. Towards the evening Columbus returned to his ship accompanied with many of the islanders in their canoes. "Thus," says Dr. Robertson, "in the first interview between the inhabitants of the Old and New Worlds, everything was conducted amicably, and to their mutual satisfaction. The former, enlightened and ambitious, formed already well ideas with respect to the advantages which they might derive from the regions that began to open to their view. The latter firm; and undiscouraging had no forebore of the calamities and defolation which were approaching their country."

From San Salvador, Columbus proceeded on other discoveries; he saw several islands, and touched at three of the largest, on which he beffow the names of St. Mary of the Conception, Ferdinand, and Isabella. He visited also Cuba and Hispaniola; wherever he went he inquired for gold, and having obtained a certain quantity of the precious metal, and made other arrangements, he took his departure homewards. He encountered a violent tempest, in which he nearly lost his ships. While all on board were overwhelmed with a sense of personal danger, Columbus was only anxious for the means of preserving a record of his great discoveries. Retiring to his cabin, he wrote an account of what he had seen and done, which he covered with wax, enclosed in a tight cask, and committed to the sea with a proper direction, hoping that it might be fortunately landed on some European shore. The storm, however ceased, and in a few days he found himself approaching the Azores. Here he obtained provisions, and renewed his voyage. When he was almost within sight of the Spanish coast, another storm arose, that forced him to take shelter in the Tajus, from whence he proceeded to Lisbon; where, in the presence of the king of Portugal, he narrated every thing that he had done and seen. Columbus remained at Lisbon but five days, and on the sixteenth of March he arrived in the port of Palos, seven months and eleven days from the time when he set out thence. As soon as his ship was discovered, the inhabitants ran eagerly to the shore, to welcome their relations and fellow-citizens, and to learn the tidings of their voyage. Columbus repaired to the court, then at Barce lona, where he was received with all the respect and honour due to his great achievements. Every mark of attention that gratitude or admiration could suggest was conferred upon him. All his stipulated privileges were confirmed, his family was ennobled, and, which was most satisfactory to his active mind, was immediately fitted out for him. This consisted of 17 ships and about 1500 persons; of whom a large number were men of distinction, destined to settle in the newly discovered countries.

On the 25th day of September 1493, Columbus sailed from his second voyage from Cadiz. He first reached the Caribbe or Leeward islands, which he visited, and then proceeded to Hispaniola, where he had left a small garrison of his own men, but who had been destroyed, probably by misconduct on their own parts, by the natives. Instead of waiting his time in punishing past wrongs, Columbus took precautions for preventing any future injury. With this view he built a small town, which he named Isabella, in honour of his royal patrons. While some were employed in the necessary operations of building, he sent others to explore the interior of the country, in the hope of finding gold. The hardships to which the Spaniards were obliged to submit, rendered them impatient of control, and it was with the utmost difficulty that Columbus could maintain any subordination. Signs of mutiny were every where exhibited; and to the commander was imputed the most unworthy notions, by persons from
whole rank in society better and more rational conduct might have been expected. Having, however, by prudence and vigour allayed the ferment. He left his brother Diego as governor of the settlement, and proceeded with a squadron in quest of new discoveries. During a tedious voyage of five months, in which he endured every hardship, he discovered only the island of Jamaica. But on his return to Hispaniola, he had the satisfaction of finding there his brother Bartholomew, whom he had not seen for a long period, and who had brought with him a large supply of provisions and men. About this period the native Indians perceiving that the yoke imposed upon them by the invaders would prove intolerable, resolved, if possible, to free themselves from so dreadful an evil. Hostilities were commenced, and much blood was shed on both sides; but in the event the Indians were completely defeated. The conference with which the Indians were filled by the noise and havoc made by the firearms, by the impetuous force of the cavalry, and the fierce outlay of twenty large dogs trained for the purpose, was so great, that they threw down their weapons, and fled, without attempting further resistance. Many were slain, more were taken prisoners, and reduced to a state of the most humiliating servitude; a rigorous tax was imposed upon them of gold, which was the dearest object of European ambition, and which was now become necessary to plead the cause of Columbus in Spain, where numerous accusations had been laid against his conduct. Willing, however, to meet the charges in person, he invited his brother Bartholomew with full power of government during his absence, and then set sail. He arrived in Spain in 1496, and immediately appeared at court, with the modest but determined confidence of a man, conscious not only of his own integrity, but of having performed many very eminent services for the state, in whose employment he had embarked. The dignity of his conduct silenced his enemies; and, with the affluence of the gold and precious commodities which he had brought with him, he recovered the good opinion of his sovereigns. They resolved to make every exertion to render the new colony a permanent and complete establishment, by sending out fresh reinforcements as Columbus thought necessary for the purpose.

It was not, however, till late in the spring of 1498, that he was enabled to proceed on his third voyage; during which he discovered Trinidad, at the mouth of the Orinoco. The vast size of this river, though only ranking in the third or fourth magnitude of rivers in the New World, convinced him that it must have its rise in a great continent. He even touched upon various parts of the continent, without sufficient reasoning that they belonged to islands which he had not hitherto explored. Columbus arrived at Hispaniola in August, where he found that his brother had removed the colony to St. Domingo, on the opposite side of the island. During his absence, a mutiny had been excited, and some of his people had deserted from the main body. To calm the discontent, he gave them allotments of land, to which were annexed divisions of poor natives, that proved to them an intolerable source of oppression. New complaints were secretly transmitted to court against him and his brothers; and having no opportunity of vindicating his conduct, his powers were at first greatly abridged by a separate commission of discovering having been granted to Alphonso d'Ojeda; who was accompanied in his voyage by Amengo Velpice, after whom the whole New World has since been named. Columbus was then recalled, and Francis de Bovadilla appointed in his stead. By his unworthy and insolent successor, Columbus was thrown in chains, and treated with other indignities, which have for ever disgraced the court that granted to him so much power. The captain of the ship, to whose charge Columbus was given, offered, in the most respectful manner, to liberate him, but he indignantly refused to suffer his irons to be removed, but by the express command of his sovereigns. On his arrival in Spain, he was婴antly set at liberty, and treated with that civility and kindness from the king and queen which he had formerly experienced. Bovadilla was disgraced, but Columbus could not forget the injuries which he had suffered; he carried with him, wherever he went, the fetters he had worn, and ordered that they should be buried in the same grave with himself.

In 1502, he obtained permission to make a fourth voyage and on arriving off St. Domingo, he found eighteen ships richly laden ready to depart for Europe. His own experience led him to perceive an approaching storm; he accordingly requested permission to enter the harbour, and at the same time warned the fleet of the dangers to which it would infallibly be exposed by failing at that juncture. His request and his warning were equally disregarded. The hurricane came on, and though, by proper precautions, he saved his own vessels, he fell up in the fleet with so much violence, that only two or three vessels escaped; and Bovadilla, with several others of his most inconstant enemies, perished with all their ill-gotten wealth. Among the vessels that weathered the storm, was that on which the wreck of Columbus's property was embarked. This, which, by some, was referred to the superintendence of providence, was, by others, imputed to certain magical arts exercised by Columbus himself. In pursuing his voyage, he traced the coast of Darien, in hopes of discovering a strait, which he fondly imagined would open a new tract to the East Indies. Although he was disappointed in his expectations, he was, nevertheless, so much delighted with the fertility of the country, and conceived such an idea of its wealth, from the speciments of gold produced by the natives, that he resolved to leave a small colony upon the river Belem, in the province of Veragua, under the command of his brother, and to return to Spain, in order to procure the means requisite for rendering the establishment permanent. On his voyage, he was driven back by a violent tempest from the coast of Cuba, his ships fell foul of one another, and were so much shattered by the shock, that with the utmost difficulty they reached Jamaica. Here he endured the greatest calamities, as well from the mutinous dispositions of his own men, as from the suspicions of the natives, who refused to supply him with provisions, till, by his skill in astronomy, he predicted the event of an approaching eclipse, a circumstance that gave him an irrefutable authority over their minds. From this time the superfluous natives generated him as a god, and not only nurtured him profusely with provisions, but cautiously avoided every thing that could give him offence. Columbus was at length delivered by a fleet sent from Hispaniola; and, after various difficulties, he arrived at St. Lucar in Spain in December 1504. Here, in addition to his other fillings, he learned that his patroness, Isabella, was dead; from her alone he anticipated the redress of his wrongs, which he little expected from the king. To him, however, as the last resort, he applied, who comforted him with promises, but, who, instead of granting his claims, insulted him with the proposal of renouncing them all for a pension. Disgusted with the ingratitude of a monarch whom he had served with fidelity and succour; exhausted with the calamities which he had endured; and broken with the infirmities which he had brought upon him, Columbus breathed his last at Valladolid, on the 20th of May 1506, in the 59th year of his age. In the closing scene he exhibited a dignity and composure
of mind suitable to the greatness of his character, and to those sentiments of piety which he had ever cherished in all the trials to which his life had been exposed. Ferdinando, who had flighted his well-founded claims when living, bestowed upon him funeral honours, and confirmed to his children their hereditary rights. Columbus was buried in the cathedral at Seville, and on his tomb was engraved an epitaph, the memory of his renowned actions and discovery of a New World, which in justice ought to have been denominated Columbus, in order that the name might for ever excite the remembrance of the hero who, in spite of every obstacle, succeeded in realizing a project, esteemed by his contemporaries as the chimera of a disturbed imagination. Robertbt's Hist. of America.

Jullianus, in his curious edition of the P. thygleti Plater, 1516, of which a beautiful copy is preferred in the Cliche-rode collection in the British Museum, has introduced, by way of commentary on Pl. xix. 4, "their words are gone forth to the ends of the earth," a very curious sketch of the life of Columbus, an account of his discovery of America, and also a description of the inhabitants, particularly of the female native Americans.

COLUMBUS, Congregation of St., is the name of a congregation of regular canons, formerly of great extent; having under it an hundred abbeys or monastry-ries, in the Britith islands. See Congregation and Canon.

COLUMELLA, in Anatomy. See Uvula.

COLUMELLA, in Botany. See Pulv. Linn. In Bijography, was born at Cadiz, and flourished at Rome in the time of the emperor Clau-tus. He is chiefly celebrated for a work which has come down to our own times, entitled "De Re Rustica," and which contains, in twelve books, rules concerning the culture of various vegetables, and the management of domestic animals. A separate book "De Arboribus," is annexed to these. They have gone through many editions, but the best and most accurate is that in Gellner's collection of the Re Rusticae Scriptores. Mor.

COLUMELLA, Rufius teres, a name given by Morgagni, and some others, to the muscle called by Albinus azygos vena.


Sp. C. tenus. Root biennial. Stem cylindrical, pubescent, coruscous at the top. Leaves an inch and a half long, fiddle, linear, obtuse, hairy. Flowers both of the disc and ray yellow, fiddle, solitary at the divisions of the brancher. A native of the Cape of Good Hope.

COLUM, in Architecture, columna, Latin, derived from column, a support. In a strictly architectural sense a column may be defined as an object consisting of a nearly cylindrical shaft with a capital, and either with or without a base. The column, as forming the principal part of an order of architecture, will be considered under the articles Doric, Ionic, Corinthian, Tuscan, and Composite Orders, and in the present article we shall treat of columns according to their matter, construction, disposition, and use; under the first head may be placed

Column, moulded, is that made by impatation of gravel and flints of divers colours, which are bound together with a cement, which grows perfectly hard, and receives a polished like marble.

The secret of making these, it appears, the ancients were masters of, by the columns lately discovered near Algiers, which are, doubtless, the ruins of the ancient Julia Cefarea: on all these is found the very fame inscription in antique characters; the contours, accents, and even faults, being repeated in every shaft; an infallible proof of their being moulded.

Columns, fusible. Under this term are comprehended, not only columns of various metals, and other fusible matters, as glafs, &c. but also those of stone, fand to have been cast; the secret of which some will have us believe to have been known to the ancients.

Columns, transparent. Any column made of transparent matter, as were those of crystal in the theatre of Scaurus, mentioned by Pliny; and those of transparent ababaker, in the church of St. Mark, at Venice.

Columns, water, is a fort whole shaft is formed of a large jet d'eau; which spouting out water violently from the bafe drives it within the tambour of the capital, which is made hollow; whence, falling down again, it has the effect of a liquid crystalline column. See Fountain.

An instance of this we have at Quinto d'Avio, near Lisbon.

Columns, hydraulic, is that whole shaft appears to be of crystal; being formed by a number of little threads of water, falling from holes made in a gift of metal, at equal distances, by means of a pipe mounted through the middle thereof; as in the gardens at Versailles.

Columns, hydraulic, also denotes a column from whose top proceed a jet d'eau, to which the capital serves as a baloon; whence the water descends by a little pipe, which turns spirally around the shaft. Such are the Ionic columns of the cascade of the Belvedera at Firecati; and those of the vineyard Mathiei at Rome.

Columns, with regard to their Construction.

Columns of bands or tambours, a column whole shaft is formed of several courses of ilone or blocks of marble of less height than the diameter of the column, this is what Ulpius means by columna frustrata, or adpata, which is opposed to the columna solidi, or integra, i.e. of one piece. This method is only practised in very large columns, for instance as the Trojan column. Smaller columns are often composed of three or four pieces, and this method the French distinguished by a particular term, colomne par troncons, of which we have no proper translation.

Columns of False, is built of rough stones or compact bricks, and covered with stucco.

Columns, geminated, that whole shaft is formed by three similar and equal sides, or ribs of stone, fitted within one another; and fastened at bottom with iron pins, and at the top with cramp-irons. This is to be fluted, that the joints may be the less discernible.

Columns, retusated, is made of several ribs, or thin shells of fine marble, or some other rare stone, cemented upon a mould of flonses brick, or the like. This is done with design both to save the precious matter, as oriental jasper, lapis lazuli, agate, &c. or to represent pieces of such stones of an extraordinary size, by the neatness and clofeness of the inculcation, which renders the joints imperceptible.

Columns, banded; a column whose shaft has several bands or cinctures either plain or ornamented, which project somewhat beyond the general line of the shaft. Banded columns were first introduced by De Lorme at the Chapel de Villes-Cohores, and at the Thuilleries, who imagined
impressed this method of concealing the joints of the different blocks of stone forming the shaft.

**Columns, fluted.** Called also *channelled, and frieze columns*; that whose shaft is adorned with flutes or channeledings: either from top to bottom, or only two thirds of its height.

**Columns, cabled or rudimental.** Is a fluted column, whose channels are filled in with allargals which generally reach one third of the height of the shaft from the base.

**Columns, cylindrical.** Is that which has neither swelling nor diminution.

**Columns, diminuted.** Is that which has no swelling, but whose shaft is tapered in a slanting line from the base to the capital. This is the method observed in, we believe, all the Greek remains of architecture, and in many of the Roman, as in the portico of the Pantheon. The opposite practice of giving an entasis or swelling in the middle of the shaft is obscurely mentioned by Vitruvius, and has been generally followed by modern architects.

**Columns, oval.** There are a few instances of oval columns in the remains of antiquity. The Mausoleum at Rome, and the frontispiece of the church of the P. P. de la Merci at Paris offer some modern examples.

**Columns, polygonal.** That whose shaft is formed in imitation of the trunk of a tree, with bark and knots. This kind of column, in the Tuscan proportion, may be used in the gates of parks and gardens; and in the decorations of pastoral scenes, &c.

**Columns, polygonous;** a column of which the horizontal section forms a polygon. There are various examples of this form in Egyptian architecture, it is also observed in the lower part of the columns of a portico on the island of Delos and at the temple of Cora.

**Columns, twisted;** a column whose shaft is twisted round in the manner of a screw with six circumvolutions. Vignola first discovered a method of drawing it by rule. The barbarous and ridiculous practice of twisting columns has been much used by modern architects, especially in the foreen and altar-pieces of churches. The most celebrated instance is the Baldaquin of St. Peter’s. Columns spirally fluted are seen in the temple of Spolets, they are also not unfrequent on the sarcophagi’s and other ornamental works of the lower ages.

**Columns, Corinthian;** that adorned with foliages, or leaves and branches turned spirally around the shaft; or in form of crowns and feathers. These were used by the ancients for erecting statues on; which hence took the denomination of *corinthia.* They are very suitable in triumphal arches, and decorations of theatres.

**Columns, hermetic.** See *Herma.*

**Columns, denominated from their disposition.**

**Columns, inferted, or backed;** is that let into a well, a third or fourth part of its diameter.

**Columns, niched;** is that whose shaft enters, with half its diameter, into a wall, which is hollowed for its reception; with its plane parallel to the profile of the torus. Such is that in the portal of St. Peter at Rome.

**Columns, angular;** is an inferted column, placed in the coin, or corner of a portico; or inferted into the corner of a building; or even a column that flanks an angle, either acute or obtuse, of a figure of many sides.

**Columns, cantonned;** are those engaged in the four corners of a square pillar, to support four springs of an arch.

**Columns, coupled;** are those disposed, by two and two, as almost to touch each other at their bases, and capitals, as those in the peristyle of the Louvre and at St. Paul’s cathedral.

**Columns, doubled;** is an assemblage of two columns, joined in such a manner, as that the two shafts penetrate each other with a third of their diameter. Such are those of the four angles in the court of the Louvre.

**Columns, flanked, according to M. Blondel,** is a column engaged with one half, or at least one-third of its diameter, between two demi pilasters.

**Columns, grouped, are those placed on the same pedestal, or socle; either by three and three, or by four and four.**

**Columns, isolated, is that standing free, and detached on all sides, from any other body.**

**Columns, median.** Vitruvius gives the name *columna mediana* to the two columns in the middle of the porch, which have their intercolumnation larger than the rest; that if these last, for instance, be  pyrgoides, the medians are equilateral.

The term may also be applied to the middle row of columns, in a frontispiece adorned with three orders.

**Columns, denominated from their use.**

**Columns, aeronautical, is a kind of observatory, in form of a very high tower; built hollow, and with a spiral ascent to an armillary sphere placed at the top, for observing the motions of the heavenly bodies.** Such is that, of the Dei order, erected at the Hotel de Soffiens, at Paris, by Catherine De Medicis, for the observances of Orontus Finensis, a celebrated astronomer of that time.

**Columns, chronological, that bears some historical inscriptions, digested according to the order of time; as by lutes, Olympiads, falli, epochas, annals, &c.** At Athens there were columns of this kind, whereon were inscribed the whole history of Greece digested into Olympiads.

**Columns, funeral;** a column placed over a tomb, and bearing an urn, or some symbol or inscription relating to the deceased. See *Cippus.*

**Columns, gymnastic, is a cylinder, wherein the hour of the day is represented by the shadow of a style.** Of these there are two kinds; in the one, the style is fixed; and the hour-lines are no more than the projection of a vertical dial on a cylindrical surface.

In the other, the style is movable; and the hour-lines are drawn to the different heights of the sun, in the different feasons of the year. See *Dial.*

**Columns, indicatrix, that which serves to swew the tier, &c. along the sea-coasts.** Of this kind, is the milestone at Grand Cairo, whereon the overflownings of the Nile are expressed; by this they form a judgment of the succeeding feason; when the water, for instance, ascends to twenty-three feet, it is a sign of great fertility in Egypt.

**Columns, itinerary, a column with several faces, placed in the cross-ways in large roads; serving to swew the different routes, by the inscriptions thereupon.**

**Columns, titular, at Rome, according to Festus, was a column erected in the herb-market, which is now the place Montanara; which had a cavity in its pedestal, wherein young children, abandoned by their parents out of poverty or inhumanity, were exposed, to be brought up at the public expence.**

**Columns, legal.** Among the Lacedemonianas there were columns raised in public places, whereon were engraven the fundamental laws of the state.

**Columns, limitrophous, or boundary, is that which swews
the limits of a kingdom, or country conquered. Such was that, which Pliny says Alexander the Great erected at the extremities of the Indies.

As to those of Hercules, ordinarily called his columns, or pillars; they are two very steep mountains in the bleeding of Cadiz, now Gibraltar.

**COLUMN.** From the Latin *columna*, *spolia of the enemy*; a column adorned with trophies, built in imitation of trees, wherein the spoils of enemies were anciently hung.

**COLUMN, menian,** any column which supports a balcony, or menina. The origin of this kind of column, Suetonius and Aelianus refer to one Menias; who, having fold his house to Cato and Fleucus, confided, to be converted into a public edifice, referred to himself the right of raising a column without-fide, to bear a balcony; whence he might see the floods.

**COLUMN, military,** was a column of marble, raised by order of Augustus, in the middle of the Roman Forum; from whence, as a centre, the distances of the several cities, &c. of the empire were reckoned, by other military columns disposed at equal distances, on all the grand roads. This column was of white marble; the fame with that which is now seen on the ballustrade of the staircase of the capital at Rome. Its proportion is massive; being a short cylinder, supporting a symbol of the globe of the earth.

It was called *militarium aureum*, as having been gilt, at least the ball, by order of Augustus. It was restored by the emperors Vespasian and Adrian; as appears by the inscriptions.

**COLUMN, military,** among the Romans, a column wherein was engraved a list of the forces in the Roman army, ranged by legions, in their proper order; with design to preserve the memory of the number of soldiers, and of the order preferred in any military expedition.

The Romans had another kind of military column, which they called *columna bellica*, standing before the temple of Janus; at the foot whereof the consul declared war, by throwing a javelin towards the enemies countries.

**COLUMN, phosphorical,** a light house; or a hollow column, built on a rock or the tip of a mole, or other eminence, to serve as a lantern to a port.

**COLUMN, symbolical,** is a column representing some particular virtue, by the attributes proper thereto; as that of the French order, set with *fleur de lis*, in the frontispiece of the Jesuits church at Rouen: or some memorable action; as the *Corvinian column*, on which was a crown; erected to Valerius Maximus, surnamed Corvinus, in memory of his defeat of a giant in the army of the Gauls, by the assistance of a crow.

Under the title of *symbolic columns*, may also be comprehended those that serve for symbols. Such is that on a medal of Nero, which expresses the integrity of the Roman empire. See Symbol.

**Columns, hijlorical, memorial, honorary, triumphal.** Under this head may be placed various distinguished columns, which rank among the eminent works of art ancient and modern, and form the chief ornaments of the situation in which they are placed. The most celebrated of these is the triumphal column of Trajan at Rome. This monument was built by Apollodorus the most famous Roman architect in the Forum Romanum. The height of the column is 106 feet, with a diameter of nearly 13 feet; it is placed upon a pedestal of 19 feet high; upon the capital there is a crowning which formerly supported a statue of the emperor, but, at present, a bronze statue of St. Peter, about 14 feet in height. The base and capital are of the Tuscan order. The column, with the crowning, is composed of 34 tambours or blocks of white marble, and the shaft is adorned, mounting spirally from top to bottom, representing the victories of Trajan over the Dace. Four eagles at the corners of the pedestal support, in their beaks, feathers of laurel, and the sides of the pedestal are richly ornamented with a variety of military weapons. The inside of the column contains a staircase, which ascends to the capital, and as each block of stone forms the whole diameter of the shaft, the steps are wrought out of the solid.

The Antonine columns, though inferior in design, and the beauty of sculpture to the last mentioned, is one of the most considerable monuments of ancient Rome. It was erected by Marcus Aurelius, and consecrated by him to Antoninus Pius. The base was placed upon the summit, on the shaft however are represented the actions of Marcus in the Marcoman war. The column is 56½ feet in height, with a diameter of 11½, raised upon a pedestal of 26½ feet. The construction of this column is exactly similar to that of Trajan; its base and capital have Doric profile.

At Alexandria there is a remarkable column, which is commonly called Pompey's pillar. It is a column of the Corinthian order raised upon a short pedestal. The shaft is 67 feet long, and nearly nine feet in diameter, at the bottom of a single piece of granite. The whole height of the column and pedestal is about 300 feet. At Conflantinople there were two triumphal columns similar to those of Trajan and Antoninus; the column of Conflantine is entirely destroyed, and of the other erected by Arcadius by Theodosius, only the pedestal and the first course of the shaft remains.

Lastly, may be mentioned the monument of London, which is the largest column in existence, being fifteen feet in diameter, and 202 feet high, including the pedestal and crowning. This column was erected in memorial of the great fire of London; its architect was Sir C. Wren.

**COLUMN, rostral,** a triumphal column adorned with the beaks or prawns of gallies, in memorial of a naval victory. The first rostral column was erected in the capital, on occasion of the defeat of the Carthaginians by C. Dinnius. Augustus constructed four with the prawns of the ships taken from Cleopatra.

**COLUMN, scenography of.** See Scenography.

**COLUMN, in French.** Column has been very erroneously defined by many writers on military subjects to be a long deep box of崇高 or being. The definition, confining a column to a file of troops, is far from giving a true idea of it; it conveys one totally erroneous. For a column consists both of ranks and files. A column may, therefore, be defined to be a corps or body of men with ranks and files in the form either of a square or rectangle, who march in time, or with one and the same movement, keeping a sufficient interval between every two of the said ranks and files, in order to avoid confusion. A column may be in the form of a square, having its front equal to its depth; or it may be of a rectangular form, having either its front equal to one of the shorter sides of the rectangle, and its depth equal to one of the longest, or its front equal to one of the longest sides of the rectangle, and its depth equal to one of the shorter.

In marching troops in columns, particularly towards the enemy, great care should be taken, that they advance as nearly as possible alike, and not one before another, that they may, if attacked, be able to afford mutual aid and assistance to one another, and that as they approach the field of battle they prefer their distances with as much accuracy,
accuracy, that when they wheel and form there may be neither too much nor too little ground for each squadron and battalion. This is a nice point, and an operation that is seldom executed correctly.

The most disadvantageous order of march is that which compels an army to move in one column. The more columns it is divided into, and the smaller their depth, the more easily and expeditiously are the troops composing them formed in order of battle. And the most advantageous method of marching an army is that which makes it move in order of battle, without dividing it into columns at all. But open level, and uncultivated ground of sufficient extent for this purpose is rarely to be had near.

COLUMN Circa, a solid compact column, with very little space or interval between the divisions equal commonly to their respective fronts.

Column, Opera, a column with interval between the divisions equal commonly to their respective fronts.

Columns, among Præterit, is half a page, when the page is divided into two parts, from top to bottom. See Printing:

COLUMNAR, Famos, in Botany, a learned botanist, was born at Naples in 1768. His whole works, attached only to the study of natural history, particularly to acquire a knowledge of the properties of plants, in which he became eminent. He excelled also in the knowledge of languages, music, of mathematics, and in drawing, of which he is said to have made much use, the greater part of the engravings in his works being taken from his own designs. He was in the habit of studying the works of Dioscorides, Bournaveys, in order to find a remedy for certain ills, to which he was subject. That he was not successful in his search is probable, as he is said to have received the greatest benefit, having previously tried numerous medicines, by the application of a cautery to one of his thighs. The operation was performed by Severinus in the year 1650. He died in 1671, aged 83 years, and is said to have totally outlived his faculties.

Haller gives him great credit as a reformer and improver of the study of botany, for the light he threw on the many obscure pollices in Dioscorides, and for the number of plants he described not before known. The figures of the plants he has given, which are generally collected in executing, are among the earliest copper-plate engravings in the knowledge of natural history. His first work, which was published when he was only 25 years of age, "Plantarum Aliquot Historia, in qua decemvium plantarum rariorum, antiquarum delineationibus respondent." was notified in 1560, 4to, far exceeding what had been done before in that line. The engravings are all more accurate than had been before been seen. "In plu (the wild vatican) charter eximia exemplis." Haller says, it is the plant, the root of which Dioscorides recommended in his complaint. He took of it for a long time with advantage; he left it, but it did not effect a cure. The works were reprinted in 1544, 4to by James Plancus, with observations by the Lucre, a society of naturalists, to which Plancus had belonged. Annexed is a short history of his life. "Minus cognitam rarissima phantastica ejus oratio orientum illustrat, cepha frea non pacis ab antiquis descripsit dicendum, et declarat." Rome, 4to. This was prepared for the press in the year 1600. The dedication was in the year 1562, but did not appear until the year 1650. He now dedicated the flowers, fruits, and seeds of the plants, and began to arrange them from the first of their parts. A second part of this work soon followed.

In 1675, his "Adnotationes, et additiones ad opus Francisci Hernandes, et Naui Antonii Recchi" appeared. In this he makes further advances in the classification of plants, from the resemblance of the petals. "Stilum et Flamina novum." In his work appear the first drawings of the flowers, by which Linnaeus, more than a century afterwards, became immortalized. He was a member of the illustrious academy of the Lincei, established at Rome, which rendered great services to the republic of letters as long as it subsisted. Columna invented a natural instrument, which he called "Synhicus Lycus," from the name of his academy; it was composed of 500 rings of different lengths, and the tone of each was divided in four parts, according to the method of Antiochus, to include all the genera, diatomic, triatomic, and tetratomic. He published his invention in a work like wise entitled "Synhicus Lycus," printed at Naples in 1618. Some later editions were published under the title, "Delin instrumento perfetto." We make no reflections on the excellence of this instrument, having never seen if but conjecture, that from the belly being loaded with so great number of rings, the tone must be very feeble; it must likewise have been difficult to tune for the three to the unaided ear. The rings are difficult to keep in tune.


COLUMN Affe, is used by some writers of anatomy, for the fibrous end of the nodule, putting out over the upper lip.

COLUMN Arie, is sometimes used for the veins.

COLUMN regio, in Ancient Geography, a place of Italy, over against Sicily, on the bank of the Strait, and near Regium Julia. It is mentioned in the Itinerary of Antonine.

COLUMNAE, a name given by Ephorus, cited by Pliny, to the small island on the route from the Red Sea to the island of Crete. G. Hardouin thought they were the Macareus Iles.

COLUMN Alban, or white columns, called by Herodotus (I. iv. c. 138.) "Figuris harmonie," a place of Atia Minor, to the south of the river Menelas, and very near it.

COLUMNAE, in Anatomy, called also lacerati, and columnae cordis, are several small muscles in the ventricles of the heart; derived, and, as it were, detached from the parietes of those ventricles, and connected by tendinous cords to the two parts of the heart.

These little columns, or pillars, being fastened to the parietes of the heart on one side, and the tricuspid and mitral valves on the other, do, by the contraction in the fylodes of the heart, draw out the valves; and by that means not only shut the orifices of the veins, but more exactly close the ventricles in their fylode.

COLUMNAr Herculis, the columns of Hercules, in Ancient Geography, the name given to the first of Gibraltar, called also Fretum Cadizium and Fretum Herculeum. These columns of Hercules were proper to the two mountains of Calpe in Europe, and of Abyss in Africa. Some have supposed that Hercules called them by his name; but others consider Hercules as an imaginary hero, whose name is formed of the Phoenician "Harahkel," signifying a merchant or voyager. Hence, they say, it is not astonishing, that this should be called "the Strait of Voyagers," and that its name should be derived from the Phoenician language, since the Phoenician navigators had made it known, and continually sailed through it.

COLUMNAE Marble, See BASTARTE.

COLUMNAE Fretae, a mineralogical term for the prisms into which different floras of the earth are sometimes found fault or divided, generally in a direction perpendicular to the lamina of the floras or nearly; these most commonly occur in basalt or trap, those of Stope in Saxony, exceed 300 feet in length, without any articulation or division. Dolomse observed columnar basalt in the floras of mount Etna.
Etan. At Cleteton in Devonshire, Mr. Hawe observed an irregular column in the Toad flax or trap. (Mawe's Dib. c. 40 and 51.) Porphyry is often found in a columnar form, see 2 Brg. Journ. 1790. 325, and Harding, 48. Sand-flax in the east and north parts of Bohemia, are often split into columns, resembling billets, 2 Berg. Journ. 1790. 70. Lime-flax is sometimes found rent into polygonal pillars of 4, 5, &c. sides like halftas, as at Rioms and Rhodin in the Vivarais, and in Saxony. Charpentier 29. See Basalt Trap and PRismatic columnars.

COLUMNARIS, in Botany, a name given by Gome to the in the tail, nolky holl flower; the camparina halesfenca, Ger. Emac. 5. 2.

COLUMNARIUM, in Roman Antiquity, a heavy tribute, demanded for every pillar of a house. It was first hit on by Julius Caesar, in order to put a stop to the extravagant expenses laid out on sumptuous buildings.


Gen. Ch. Cal. One-leaved, deeply five-efled, generally somewhat swelling at the base, permanent; segments erect, equal, lanceolate. Cor. monogynous, much longer than the calyx, labiate; upper lip erect; lower lip two or three-cleft. Stam. Filaments four free; anthers joined together. Filj. Germ superior, egg-shaped; style filiform, the length of the upper lip; style bifid, obtuse. Peric. Capule globular, one or two-celled. Seeds numerous, small, attached to a large receptacle.


94. Flor. Ind. occ. 2. 1060. (Achimeles major; Brown. Jam. 270. tab. 39. fig. 3. Rupennis polyanthos; Millan. Jam. 278. tab. 170. fig. 1.) "Leaves egg-shaped; acuminate, serrated, rough, with hairs on the upper surface, segments of the calyx tooth serrated, bifid; corolla bifid; upper lip bifid." Rest perennial. Whole plant succulent. Stem thick, throwing its branches to the height of four or five feet when supported. Leaves opposite alternately larger. Flowers large, beautifully variegated; segments of the calyx almost punctated like those of the rose. A native of the cooler mountains of Jamaica; introduced in 1780, by the margin of Rockingham; flowering in November. 4. C. bifolia. Mart. 4. Wild. 4. Swartz. Prod. 94. Flor. Ind. occ. 2. 1063. "Leaves egg shaped, obtuse, slightly toothed, bisped bifid; segments of the calyx entire, hairy; stem hairy, scabrous." A native of Jamaica. 5. C. hirtus. Mart. 5. Wild. 3. Swartz. Prod. 94. Flor. Ind. occ. 2. 1063. "Leaves ovate-lanceolate, slightly toothed, rather scabrous, bifid and coloured under beneath, calyx villous; segments linear; corolla villous." A native of Jamaica, in shady woods, attached to the trunk of trees. 6. C. foliata. Wild. 6. Loud. Cochon. 384. "Leaves pinnate bilabiate; stem creeping." Stem herbaceous, perennial, cylindrical, slender, whitish. Branches somewhat erect, four inches long, very tender. Leaves egg-shaped, three lines long, ferrate in threes, pale green, obtusifrons, petiolate. Flowers white, fringed with red, axillary, bifid, peduncled; tube of the corolla slightly gibbous; upper lip arcuate, trifid; lower bifid; anthers egg-shaped, connected, separated with difficulty. Capsule oval, two-celled. The whole plant, except the capsule, hairy. A native of Cochinchina. It is an aquatic, of a very pleasant appearance and smell, and being emollient and cooling, is used as a wash by the women, for which purpose it is cultivated in pots or tubs filled with water, having earth at the bottom.

Columnea erubens; Lam. See Cyrrilla pahella.

Propagation and Culture. All the species require the heat of a stove. They are propagated by seeds, and should be treated like other tender exotics.

COLUMNELLA, little column, denotes the substance that passes through the capsule, and connects the several partitions and seeds.

COLUMNIA, Pompei, in Ancient Geography, a place of Thrace, at the entrance of the Thracian Bosphorus, on the coast of the Exine sea.

COLUMNIATED winding flax. See Stairs.

COLUMNIFER.E, in Botany, the thirty fourth natural order in the "Philosophia Botanica," of Linnaeus, and the thirty-seventh of "Prælectiones." In the "Philosophia Botanica," it contains the following genera: camelina, xylon, jossypium, uroca, bifibus, turmera, malope, lavatera, althaea, aleua, malva, melochia, fida, napec, waltheria, mentheza, hermennea, helicteres, and flavaria. In the Preflection, all these are continued, except mentheza, which is removed to the calycahnae; and oxylon, which was suppressed as a distinct genus by Linnaeus himself, and its species placed under oxylon. The following are added by Linnaeus, triumfetella, bixa, corchorus, theobroma, gewia, munginiga, tita, all of which apparently formed part of the above. 28. tab. 170. fig. 2. "Flowers for malchara; patapetes, bombax, adansonia, kieocarpus, antehorus, maherna, kleinoviis, ayenia, microro, then, higgleria. Stereophia is placed by Linnaeus under both the columunfere and the tricocere. In the "Philosophia Botanica," it had been placed among the latter, and when it was after-
wards removed to the former, it was most probably left in its original situation, merely through inadvertence. The following have since been added; but Gilbe acknowledges himself in doubt whether the arrangement would in all cases have been approved by Linnaeus. Symposco, Linn., and Clematoniæ, Linn., referred to this order by Swartz; palavaria, Cav.; anodo, Cav.; muscad., Cav.; affonia, Cav.; ombroa, Swart.; paronia, Cav.; aeliana, Syd. Swart.; (malavifus, Dill., Cav.) Lignarea, Cav.; cistus, Cist.; cypri, Schreb.; Cypri; (Quarzacca, Abbl. Cav.) abietii, Serb.; (Aesch., mays., Aed. Swart.) Maria, Swartz.; umbrosa, Schreb.; mulceolus, Mitchell. Cav. eretea, Swart.

Linnaeus confined that the essential character of the order is not to be understood from the name, which properly belongs only to some of the more remarkable genera. In all of them the root is fibrous; in some bulbous, or tuberous. The stem in most is herbaceous, but some are large trees; it is among the latter only, that thorns are to be found, and prickles only in some hibiti. Scarcely any plant in the whole order is smooth. All have stipules in pairs. The leaves are never opposite, most commonly petiolate; the foliation, as far as Linnaeus could recollect, always parted, and many have glabrous-pubescent under the rib. There are no tendrils in any plant of the order. The full reference is various. The calyx in many is single and five-cleft; in some double. The petals in most are five; but since the filaments are united, and in most genera adhere to them, the corolla falls off all together, as if it consisted only of one petal. Their claws, by converging often, constitute the nectar. The stamens, or at least the filaments, are equal in number to the parts of the fruit. The fruit is always superior, but various in other respects. None of the species are poisonous or fatal; they are generally more or less medicinal; and the flowers of most are beautiful.

COLUMPNATENSIS, in Ancient Geography, an episcopal see in Africa in Mauritanian Caesariensis, according to the conference of Carthage.

COLUMPA, in Botany, Rehed. See Illecebrum fissile.

CULURES, in Geography and Astronomy, are two great circles, imagined to intersect each other at right angles in the poles of the world.

The word is derived from colec, muttil, or truncate, and wta, tail; q. d. appearing with the tail cut off; because never seen entire above the horizon.

The culures pass one of them through the folilitia, and the other through the equinoctial point of the ecliptic; whence the first is denominated the fissile, and the second equinoctial.

The equinoctial curve determines the equinoxes; and the folilitia, the foliices.

By thus dividing the ecliptic into four equal parts, they also mark the four seasons of the year.

It is disputed over what part of the back of Aries the equinoctial curve passed in the time of Hipparchus. Sir Isaac Newton, in his Chronology, takes it to have been over the middle of the constellation. Father Soucius infits on its having passed over the dad-estimoration of Aries, or midway between the rump and frill of the tail. We have some observations in the Philosophical Transactions, N° 466, concerning the position of this curve in the ancient sphere, from a draught of the constellation Aries, in the Aratae published at Leyden and Amsterdam, 1652, which seem to confirm Sir Isaac's opinion; but the antiquity and authority of the original draught may still remain in question. See Chronology.

COLURI, in Geography, an island in the gulf of Egin, near the coast of Livadia, about seven miles long and two wide; 10 miles W. of Athens. N. lat. 38°. E. long. 25° 36'.

COLUSITANUS, in Ancient Geography, an episcopal see in the preconifer Africa, according to the conference of Carthage; supposed to be the same with Canthiuma.

COLUMUSA, a Creek town of Paphlogania.


Eff. Chi. Calyx five-cleft. Stigma bearded on one side. Legume peduncled, membranous, inflated or compressed, one-celled.

This species is nearly allied to algaragulus and phaera.

The total want of a partition in the legume is its only certain generic distinction. The algaragulus are completely two-celled. The phaera have a partial partition, which extends the whole length, but only half the breadth of the legume, making it semi-limbacular.

Sp. 1. C. arborifera. Common bladder-fenn. Linn. Sp. Pl. 1. Matt. 1. Linn. 1. Willd. 1. Gart. tab. 135. fig. 4. Linn. 11. 624. fig. 2. Prit. mag. tab. 81. (C. vicaria; Bauh. Fam. 305. Tourn. 649. C. hirsuta; Roth. Germ. 1. 305. H. 168.) "Leaflets inerably heart-shaped." Linn. "Leaflets oval-obovate; standard gibbos, abbreviated." Hort. Kew. A shrub. Stokes several, woody, twelve or fourteen feet high; branches numerous, woody. Leaves alternate, winged, terminated by an odd one; leaves nine or eleven, green and smooth above, glaucous beneath. Flowers yellow, with a reddish curved line at the base of the standard, in a short raceme, consisting of three or four flowers; wings only a little shorter than the keel. Legume closed at the tip. Seeds twenty or more. A native in the other parts of Europe; observed by Mr. Ray in the affluent to the crater of Mount Vesuvius, where there are fewest any other plants. It flowers with us in the early part of June, and sometimes again in the month of August, continuing till October. Both leaves and legumes are purgative, and may be substituted for the officinal fenn. (caffia fenn.) but must be taken in larger doses. They have a pungent, nauseous taste. In the quantity of a dram or two excited vomiting; but notwithstanding these qualities, the plant is said by Haller and Ray to afford a food grateful to cattle. 2. C. erucina. Oriental bladder fenn. Mart. 2. Willd. 2. L'Heritier Stup. nov. 2. tab. 41. Hort. Kew. 3. 55. Linn. 11. tab. 624. fig. 3. (C. orientalis, flore, fanguea coloris, lutecia macula notata). Tourn, Cor. 44. C. fanugiae. Pal. off. 1. 88. C. orientalis. Lam. 2. humilis. Scop. inembr. 2. 23; tab. 12. "Shrubby; leaflets wedge-shaped, inerably heart-shaped; standard gibbos, obtuse, very small." Stem woody; branches seven or eight feet high. Leaves pinnaled; leaflets eleven or thirteen, small, smooth, glaucous, more febly than those of the preceding specie. Flowers.
Flowers: deep red, with two yellow spots on the standard, small; wings considerably shorter than the keel; keel erect, appearing cut off at the end. **Legume** opening beneath the tip into a wide hole. Discovered by Turnfort in the Levant; cultivated by Miller in 1752. 3. *C. pocockii*. Pocock's bladder-fenna. Mart. 3. Wild. 3. Hort. Kew. 3. 55. (C. procumbens) L'Heritier Stirp. nov. 2. tab. 42. G. halepica; Lam. 3. 1) Shrubby; leaflets roundish-circular, very obtuse, mucronate; standard gibbous, elongated, acending. A lower shrub than the proceeding. **Branches slender, spreading.** Leaflets thirteen or fifteen, very small, entire, of a cinerous-green colour underneath. Flowers bright yellow, larger than those of *C. arboreform*, opening a month earlier, and continuing in succession till late in the autumn; peduncles shorter than the leaves, axillary, solitary, one or two flowered. The seeds were first brought to England from Cape by Dr. Pococke, and are said by Dr. Ray to be very common about Aleppo. 4. *C. fruticosum*. Scarlet bladder-fenna. Linn. Sp. Pl. 2. Mart. 4. Lam. 4. Wildl. 4. Bt. Mag. tab. 181. 1) Leaflets oblong, retuse, hoary underneath; branches silky-tomentose. A shrub, from two to four feet high; branches erect. Leaflets from twenty-one to twenty-five, green and smooth on their upper surface. Flowers bright scarlet large; peduncles axillary, from three to five flowered; keel considerably longer than the standard; wings very small. **Legumes** very large. A native of the Cape of Good Hope, and other parts of Africa. 5. *C. americana*. Mart. 8. Hoult. MSS. 2) Shrubby; leaflets egg-shaped, emarginate; legumes oblong, compressed, acuminate. Stem twelve or fourteen feet high, much branched; leaflets seven, light green. Flowers bright yellow, two or three upon each peduncle. **Legumes** near four inches long, compressed, winged, ending in long points. Sent to Miller in 1752, by Dr. Houton, from Vera Cruz in New Spain. 6. *C. galegosifolius*. Bot. Mag. tab. 792. 3) Shrubby; leaflets oval, emarginate, in about nine pairs, with a terminal one; legumes by longligid pedicels. Stem low, branches herbaceous, angular. Stipules two, egg-shaped, small, embracing the common pedicel, but distinct from it. **Flowers** dull red, inclining to orange, in a many-flowered raceme; common peduncles longer than the leaves, axillary; pedicels alternate, short, curved; bracteate under each flower, single, small, egg-shaped; calyx-teeth wide at the base, with white villous margins; standard roundish, somewhat reflexed, marked at the base with a greenish yellow spot; wings smaller than the keel; keel one-petaled, when folded nearly orbicular; style hairy on the upper surface of its whole length. **Legume** inflated, membranous, veined, oblong, oval, beaked, on a pedicel four times longer than the calyx. **Seeds** many, shining, kidney-shaped. A native of New South Wales. 7. *C. procumbens*. Mart. 9. 4) *Stems trailing; leaflets oblong, egg-shaped, tomentose; flowers axillary, on very long pedicels.* **Stems** several, woody, slender, much branched; branches not much more than a foot long; leaflets twenty-five or twenty-seven, small, narrow. **Flowers** purple, small; peduncles with three or four flowers. **Legumes** little more than half an inch long, but like a fiddle, compressed. **Seeds** kidney-shaped. A native of the Cape of Good Hope. Cultivated by Miller in 1753. 8. *C. rigida*. Wild. 5. Thumb. prod. 134. 5) Shrubby; leaflets lanceolate, smooth; *item* erect, smooth. A native of the Cape of Good Hope. 9. *C. obtusata*. Wildl. 6. Thumb. prod. 134. 6) Shrubby; leaflets linear; *item* erect; flowers in racemes, reflexed. **A native of the Cape of Good Hope.** 10. *C. lineiris*. Wildl. 7. Thumb. prod. 135. 7) *Herbaceous; leaflets linear, acute; item erect; racemes terminal, inflexed.* A native of the Cape of Good Hope. 11. *C. horrida*. Linn. Sp. Pl. 2. Mart. 6. Lawi. 8. Gaert. tab. 154. fig. 2. 8) *Leaflets linear, emarginate, smooth; item herbaceous; racemes peduncled.* Roots terminal or triennial. **Seeds** near a foot and half high, clothed with very short hairs, branched. **Leaflets** fifteen or seventeen, greenish. **Flowers** dark blood-red, small; *item* standard fimbriated, the length of the wings and keel. **Legumes** small, membranous, somewhat transparent, very thin, compressed, egg-shaped, obliquely mucronate, two-valved, peduncled. **Seeds** two or four, rather large, kidney-shaped, compressed, of a dull chestnut colour. A native of the Cape of Good Hope, cultivated by Miller in 1751. 12. *C. perforans*. Mart. 5. Wildl. 9. Hort. Kew. 3. 59 Jacq. Hort. 3. tab. 3. (C. fruticosum) Retz. Obs. 3. 42. Mart. 7.) **Herbaceous; leaflets oblong, pubescent; item erect; racemes terminal.** Root perennial. **Seeds** two or four, rather large, kidney-shaped, compressed, of a dull chestnut colour. **Flowers** white, shining, with white villous hairs, but bearded only at the tip. **Legume** oval-roundish, acuminate at both ends, compressed, flat, little inflated, smooth, membranous, somewhat pellucid, not opening of itself. **Seeds** few, compressed black. A native of the Cape of Good Hope; introduced by Dr. Jacquin in 1775. 13. *C. profusia*. Wildl. 10. Thumb. prod. 134. 9) *Leaflets lanceolate, villous; item herbaceous, diffuse; peduncles axillary, with about two flowers.* A native of the Cape of Good Hope. We should have supposed this to be *C. procumbens* taken up by professor Martin from Miller, if Miller had not expressly asserted that his plant was *C. fruticosum*. 14. *C. caudata*. Wildl. 11. Thumb. prod. 134. 10) *Leaflets egg-shaped, cut; item herbaceous, decumbent; racemes terminal.* A native of the Cape of Good Hope. 15. *C. vascularia*. Wildl. 12. Thumb. prod. 134. 11) *Leaflets egg-shaped; item herbaceous, decumbent villous; legumes orbicular, inflated.* A native of the Cape of Good Hope. 16. *C. lomento*. Wildl. 13. Thumb. prod. 135. 12) *Leaflets egg-shaped, hoary; item herbaceous, tomentose; flowers in racemes.* A native of the Cape of Good Hope. 17. *C. alpina*. Lam. 6. (Phaca alpina) Linn. P. leguminibus pedulis fernoviatis; Gmel. Sib. 4. 35. tab. 14. Altragalus; Hall. Helv. n. 401. Altragaloides eliator, ercta, vicis folis, foliis penatibus. Amon. Ruth. 148.) **Herbaceous, much branched; leaflets oblong, elliptical, hairy underneath; flowers pale yellow.** Root perennial. **Stems** near a foot and half long, weak, sometimes quite upright, sometimes half decumbent and diffuse. **Leaflets** nineteen or twenty-one, green and smooth above, diminishing in size towards the top. **Flowers** yellowish, in peduncled spikes, situated in the axils of the upper leaves; calyx bell with a few short blackish hairs. **Seeds** very small, perfectly one-celled, pedicelled in their calyx, semi-oval, or a little crescent-shaped, acute, pendulous on the common pedicle. **Seeds** from four to six, small, kidney-shaped. A native of the mountains of Dauphiné, Switzerland. Lapland, and Siberia. 18. *C. auritalis*. Lam. 7. (Phaca auritalis) Linn.; altragaloides alpina supina giaiura, Till. Hort. Pin. 19. tab. 14. fig. 1.) **Herbaceous, diffused; leaflets lanceolate, nearly smooth; peduncles longer than the leaf.** Root perennial. **Stems** from five to seven inches long, slender, weak, commonly procumbent, almost smooth, branched. **Leaflets** thirteen or fifteen, acute.
bene. Stultius two, embracing the flow, oval-obtuse. Flowers yellowish white, with a tint of violet at the extremity of the keel, sulline, in axillary spikes. *Leguminosae* demi-oval, peculiar in their calyx, terminated by a short bent thread, perfectly one-celled, smooth, not pendent. *Sesamum* five or six, small. A native of the mountains of Provence, Italy, and Switzerland. After some hesitation, we have placed the last two species under this genus, in concurrence with Le Marché, although that botanist has not, in this particular, been hitherto followed by any other author. Gérard has even figured the legume of this species alone, to illustrate the genus phase. As far, however, as the partition is concerned, he completely gives up the point, acknowledging the legume to be absolutely one-celled, without a veilage of a partition. He has accordingly introduced *宓polis,* into his generic character, and has found the essential difference between colutea and phasea on the form of the flowers. To us the entire want of a partition appears decisive. Jacquin, indeed, has attributed to his alpin a half two-celled legume; but he seems to refer to a different plant. There is much confusion in authors with respect to the synonyms of phaca-alpina, and that with the kindred species, stands in need of further investigation.

Colutea argentea argentea; Torrh. See *Coronilla argentea.*

Colutea caule genista jungofo; Bauh. Hist. See *Coronilla juncea.*

Colutea enaphyllos filigosus ind. orient.; Pluk. Alm. See *Indigofera enaphyllos.*

Colutea exscisa angulifolius; Pluk. Alm. See *Coronilla acuta.*

Colutea indica humilis, ex qua indica; Burm. Zeyl. See *Indigofera indica.*

Colutea minimas dispermum; Pluk. Plut. See *Indigofera minimas.*

Colutea filigosus glabrata ternis quinquies maderofatiana; Pluk. Alm. See *Indigofera glabrata.*

Colutea filigosus sec. secordoides major et minor; Bauh. Pin. See *Coronilla emerus.*

Colutea scopoides; Cam. Epit. See *Coronilla emerus.*

Colutea scopooides maritima glauca folio; Bauh. Pin. See *Coronilla glauca.*

Colutea scopooides minor coronata; Bauh. Pin. See *Coronilla coronata.*

Colutea scopooides odorata; Alp. Exot. See *Coronilla argentea.*

Colutea secunda; Clus. See *Coronilla coronata.*

Colutea exulants argentea tata; Hern. Lugd. Rai. Hist. See *Sophora tomentosa.*

Coluthus, in Biography, a Greek poet. a native of Lycopolis, lived under the emperor Amphilus in the beginning of the sixteenth century. His only work that has come down to us is upon the "Rape of Helen," which, though of inferior merit, has been frequently edited, and was translated into French by M. du Molard in 1742. Molard.

Colvius, Andrew, was born at Dordt in Holland, in the year 1524, where he officiated during a considerable part of his life as pastor of the Walloon church. In 1629, he was chaplain to the embassy at Venice, and cultivated an intimate friendship with the celebrated father Paul, whose treatise on the inquisition he translated from the Italian into the Latin language. Colvius was intimately acquainted with many literary characters of his own age, and was himself a philosopher and poet of eminence, but he is chiefly known as a collector of rarities of every description, of which, in the year 1675, he published a catalogue intitled "Catalogus Rariorum And Colvii." He died at Dordt in 1675. Moreri.

Colymba, or Colymbus, a term in the Greek Liturgy, signifying an offering of corn and boiled puffs, made in honour of the saints, and for the sake of the dead.

Ballamon, P. Gour, Leo Allatins, and others, have written on the subject of *colymba* the substance of what they have said, as follows:

The Greeks boil a quantity of wheat, and lay it in little heaps on a plate; adding beaten peas, nuts, cut small, and grape-hones, which they divide into several compartments, separated from each other by leaves of parsley. A little heap of wheat, thus seasoned, they call *xolymb.*

They have a particular formula for the benediction of the *colymba,* wherein, praying that the children of Babylon may be fed with puffs, and that they may be in better condition than other people, they declare God to bless those fruits, and those who eat them, because offered to his glory, to the honour of such a faint, and in memory of the faithful deceased. Ballamon refers the institution of this ceremony to St. Athenasius; but the Greek Synaxary to the time of Julian the Apostate.

Many of the Latin divines having spoken injuriously of this ceremony, Gabriel archbishop of Philadelphia, has written a discourse in its vindication: wherein he endeavours to shew that the design of the *colymba* is only to represent the resurrection of the dead, and to confirm the faithful in the belief thereof. The *colymba,* he says, are symbols of a general resurrection; and the several ingredients added to the wheat, signify so many different virtues.

Colymbasinis, in Ancient Geography, an episcopal see of Africa, in Pamphylia, according to the acts of the council of Constantiople, held in the year 381.

Colymbus, in Ornithology. Bellonius describes the tufted duck *anas fuligata* of modern writers under the name of *colymbus.*

Colymbus, a genus of the *anseridae,* having the bill torted, fabulate, straight, and pointed; throat denticulated; noftrils linear, and situated at the base of the bill; legs fettered.

Linnaeus includes in the *colymbus* genus three families of birds: the guillemot, the divers, and the grebes, each of which, in the opinion of most ornithologists, ought to be considered generically distinct. The guillemots live chiefly cloe to the sea, and inhabit rocks; they have a slender tongue the fize of the bill, and the bill itself of a compred form, with the upper mandible a little bent, and the base covered with short feathers: they are principally distingvished by having the feet three-toed. The divers have a strong bill, les pointed. cylindrical, the edges of the mandible turned in, the upper one longe; noftrils divided in the middle by a membrane tongue long, sharp, serrated at the base each side; legs slender; tail-feathers twenty in number; the chief character of these comit in the feet being furnished with four toes, and palmites; they frequent fresh waters. The grebes are without a tail, have a strong bill; lores naked; tongue a little clefs at the tip; body depressed, and thickiy covered with soft thinning plumage; wings short, and the legs comprised; the principal characteritc of this family are the lobate feet; consisting of four toes each. Those last mentioned birds frequent meres, and other inland watery places.

* Feet three-toed, Guillemot.

Macroratus. Above streaked with chestnut and brown; beneath
COLUMBUS.


Inhabits the western parts of America and Kamtschatka. This bird is ten inches in length; the crown is dusky; some of the greater quill-feathers edged with white; chin dusky, with white fringes.

In America and Kamtschatka. This bird is ten inches in length; the crown is dusky; some of the greater quill-feathers edged with white; chin dusky, with white fringes.

This bird is nine inches long; the head and neck are brown; the back of the neck is red, and the rest of the body is white. It is found in the Arctic regions, and is called the "Arctic diver." It is a large bird, measuring about three feet, with a large white spot on the head, and is found in the Arctic regions.


A general inhabitant of Europe and America, frequenting the sea-coasts, and preying on fish; it builds its nest on the ground, the eggs are white, and spotted with black. This species is liable to some variation in the disposition of its spots, and appearance of plumage. One variety found at Amsterdam is of a footy black colour, with a double white band. Another is streaked above; beneath white, banded with cinereous; upper wing-coverts variegated with white and black; this is the white banded of Brunnich, and inhabits Greenland. A second variety mentioned by the same author has the back, wings, and tail black; head, neck, and body beneath, with the spot on the wings white. Dr. Latham describes a variety from Kamtschatka of a black colour, with the crown clouded; the greater wing-coverts, and under side of the body, varied with white and black; throat entirely white; and lastly, the unia grayibides of Brunnich is considered by some as a variety of this species; the upper part of the plumage of this bird is spotted white and black, the colour beneath white.


This bird inhabits Europe and America, and is found in maritime situations, as its principal food consists of sea-fish; its usual resort is the steep and molten inaccessible cliffs on the sea-shore, and in such places where the water is shallow on our own coasts during the summer, in which season they breed. The places most celebrated for the resort of these birds are the Isle of Portland, in Devonshire, between Caenarvonshire and the island of Anglesea; on a rock called Godrevy, not far from St. Ives, Cornwall; the Farn island, near the coast of Northumberland; and the cliffs about Scarborough, Yorkshire. They are rare birds, and so stupid, that having once attained access to their haunts, they may be knocked down in any numbers with a stick, for though they see their companions killed before them, they never attempt to quit the rocks. In many parts they are killed by the inhabitants both for the sake of their flesh and skin; the former is, however, not remarkable for its delicacy, and has a strong fishy taste. The natives of Greenland and Kamtschatka make garments of their skins. Like the auk, this bird lays but a single egg; the eggs are in two, white, of medium size, for the table the flesh. The length of this

bird is seventeen inches. There are several varieties of this species.

We have followed the example of Linnaeus and Gmelin in confounding the four above-mentioned birds as appertaining to the columbus genus, but it should be at the same time observed, that Brunnich constitutes a distinct genus of them under the title of uria, and that this genus is adopted by Dr. Latham, in his Index Ornithol. Junc., though he adheres to the Linnaean method in his "General Synopsis."

**9.** Feet four-toed, paleated, Diver.


This is a large bird, measuring about three feet in length; the upper part of the body with the bill, legs, and tail are black; the back and upper part of the wings is marked with a number of white spots disposed in rows. Inhabits the Northern seas, and is rare in England. The specimen in the London Museum.

In Iceland and Greenland, where those birds breed, they are very frequent. It is also abundant on the shores of Norway, and along the Arctic coasts as far as the river Obey, in the dominions of Russia. It is seldom seen on land, except in the breeding season, being, for the most part, in the open sea, where it is continually diving for fish, which it does with the greatest address. Among the northern marine nations, the skins of these birds are prepared by the natives, and manufactured with the feathers on them in caps and other articles of dress. Gauntlets, we are told, made of these skins are warm, and never imbibe the least moisture, and are also more durable in wet than might be imagined. The bird is likewise met with among the lakes of Hudson's bay, where the natives adorn their heads with circlets of their feathers.


The length of this bird is two feet; the feathers of the back, wings, and tail are edged with white; in the male bird the front and sides of the head and neck are spotted with brown. This species inhabits the Arctic ocean; it ranks as a British species, but is rarely taken in our country.

**Stellatus.** Cinereous-brown or dusky, spotted with white; throat pale ash, beneath white. Columbus stellaris, Brun. Gmel. Micros minor, Buff. Columbus marmoratus stellaris, Will. Le petit plongeur, Buff. Speckled diver, or loon, Lath. Observed in plenty about the shores of the Baltic, and white sea, and in America. They occasionally migrate in flocks, pursuing the same course as the shoals of herrings and sprats, the latter in particular, and it is for this reason known in many parts by the name of speck loon. These birds are more common in the temperate, or southern parts of Europe, than any other of the diver tribe. The length is twenty-seven inches, the bill horn colour; legs brown. It builds no nest, but lays its eggs, which are two in number, in the grass on the borders of lakes contiguous to the sea-coast; these eggs are dusky, spotted with black.

Arcticus.
**Columbus.**

**Arcticus.** Head hoary; neck beneath violaceous, black, with an interrupted white band. *Columbus arcticus*, Linn. *Mergus guttus nigro, Briff.* Black-throated diver, Lath. Length two feet; inhabits the north of Europe, Asia, and America.


Inhabits Europe, Asia, and America, frequenting lakes, and oftentimes the open sea in qucg of prey, which consists of fish, marine infecls, and crabs. The body is brown above, with minute white spots, beneath white; bill black, head and chin cinereous, spotted with brown; neck above with small white and brown lines; the legs dusky. Length about thirty inches. These birds lay their eggs in June, the young are hatched and ready to fly before the end of August, and undertake their annual migrations with the parent birds in September. They breed chiefly in America.

**Borealis.** Body above blackish, with numerous white flecked spots; beneath white; neck on the fore-part rufous. *Columbus borealis*, Brunn. This bird was shot near Copenhagen; it resembles in size and appearance *Columbus flectatus*, and is, perhaps, a variety of that bird. Brunnich considers it as a distinct species.

**Striatus.** Blackish, beneath white; head and neck grey, lined with black. *Columbus striatus*, Gmel. Striped diver, Lath.

Inhabits North America, where it frequents lakes; it is represented as a noisy clamorous bird, and one continually in motion or on the wing, flying backwards and forwards. The bill of this species is dusky, or black, and strong; the cheeks white.

**Sinensis.** Greenish-brown, with deeper spots; breast and belly reddish-white, spotted with rufous; wings and tail blackish. *Columbus seinae*, Gmel. Chinese diver, Lath.

This species inhabits China, and is supposed to be one of those kinds of aquatic birds which are trained up, and employed by the Chinese for catching fish. The bill is dusky; and the tridens and legs cinereous.

**Fuscus.** Fuscous, beneath white; head rufous; collar black; secondary quill-feathers white. *Columbus crissatus*, Linn. *Columbus cornutus*, Briff. Le grebe cornu, Buff. Crested grebe, Lath.

Length of this species twenty-three inches; bill flesh-colour, with the tip brown, beneath white; head tumid, varies in colour by age, and has been described in the first, second, and third years' plumage, as three distinct species.

Like the rest of the grebe tribe, these birds form a floating nest, composed of grass and flags, interwoven with the roots and stalks of other aquatic plants. The female lays four eggs, which are of a white colour, and fits in the nest half immersed in water till the eggs are hatched. It preys on eels and fish, which it procures with great facility, by diving into the water. The flesh is rank, but the skins, which are prepared with the beautiful silver and silver-white plumage on them are in high request for muffts and reticuts. Many of the grebes are taken on the lakes of Geneva for that purpose. In England, those birds frequent the meres of Shropshire and Cheshire, and the great lacs of Lincolnshire, in all which places they are known to breed. The tippec grebe is said to be the young of this species.


A native of Cayenne. This bird is nineteen inches and a half in length; the bill and legs are dusky; and the lower mandible yellow at the base.


Inhabitants many places in Europe and America. Length eleven inches. The bill is black, and red at the sides; irides and lores purple; upper edge of the wings white; legs flesh-colour, inclining to purpl.

**Cornutus.** Head glossy-green, and tumid; neck beneath, and breast fulvous; through the eyes a yellow tufted band. *Columbus cornutus*, Gmel. Horned grebe, Arch. Zool.

An inhabitant of Hudson's bay; length twelve inches. Dr. Latham describes the little horned grebe, *le petit grebe cornu* of Buffon as a variety of this species.


The length of this bird is eighteen inches; the bill is dusky, and at the sides at the base tawny; the legs dusky. This is a British species; the male is very rare, the female scarcely known; both sexes are preferred in the London Museum.

**Caspicus.** Head smooth; body above dark brown, beneath silverly; bill lead colour; chin and checks white; wing-coverts brown. S. G. Gmel. Inhabits near the Caspian sea.

**Thomensis.** Fuscous; beneath white, spotted with grey; quill-feathers pale rufous; breast with a black spot. *Columbus thomensis*, Gmel. Le grebe due laart, Buff. Black-breasted grebe, Lath.

Less than the common hen; the bill is black, with the tip pale; irides and spot between the bill and eyes white; legs dusky. Inhabits St. Thomas's island in America.


This bird inhabits Europe and America, is ten inches in length, and feeds on worms, small fish, and aquatic insects. Buffon describes a variety of it under the title of "Le Cailleux des Philippines;" it is larger than the former, the plumage above purple brown; and the cheeks and sides of the neck reddish. Found in the Philippine isles.

**Dominicus.** Head smooth; body beneath thickly spotted. *Columbus dominicus*, Linn. Le cailleux de St. Domingue, Buff. White-winged grebe, Lath.

Inhabits the Antilles and Surinam. Its length is eight inches; the bill is black; body dusky, beneath silver grey; quill-feathers cinereous white; legs brown.

**Henricus.** Head smooth; body blackish; chin black;
throat; throat fuscous; belly cinereous, mixed with "Columbus huebovicus, Gmel. Black-bellied grebe, Lat.
A small and rare species, found chiefly in Tiree, one of the islands of the Hebrides.
Podiceps. Body fuscous; bill olive, dusky at the base, with a transverse black band in the middle. *Columbus podiceps,* Linn. Le caglanaux à bec circé, Buff. *Podil bill grebe, Lat.
A native of North America; length fourteen inches; irides white; chin black, surrounded with white; body beneath silvery; breast waved with cinereous; secondary quill-feathers black at the tip. The female has no black mark on the bill.

LUDOVICIANUS. Fuscous; sides of the neck and body fuscous; beneath white, with transverse blackish spots. *Columbus ludovicanus, Gmel. Le grebe de la Louisiane, Buff. Louisiane grebe.
Inhabits Louisiana. The head is smooth; legs dusky; middle of the belly silvery white.

CULYTON, or CULLITUS, in Geography, is a small but ancient market town in Devonshire, England. It is called by Risdon, a "burgh of reputation:" the housekeepers of a small district, called the borough, annually chose a portreave at the lord's court. At the Norman conquest, Colyton was the king's demesne; and King John granted the inhabitants a fair, to continue eight days. The houses are in general built with flats and mostly thatched. The parish church is a spacious stone fabric, with a tower rising above the chancel, the upper part of which is octagonal. On the south side of the chancel is an inclosed burial-place, belonging to the De la Pole family, containing various effigies, and other monumental decorations: and in a small aisle adjoining, is the figure of a girl, apparently about five years of age, under a canopy of f Wrocław; she is said to have been the grand-daughter of Edward IV., and to have been choked by a fish-bone; over her are the royal and Courtenay arms. Colyton arms are situated 153 miles S.W. from London; the number of houses is 289; of inhabitants 1641.

CULYTIUS, or CULLITUS, in Ancient Geography, the name of a quarter of the city of Athens, belonging to the Egeide tribe, and adjoining to that called Melitone. *Culm., or Com., in Geography,* one of the oldest, and formerly of the largest town of Perita in the province of Irak Agami. It has suffered greatly by the civil wars with which the Persian empire has been so often distracted, but is still a very populous place; 50 miles S. of Calamis, and 150 N. of Ithaka. It is celebrated for its silk manufactures, chiefly velvet. N. lat. 34°. E. long. 50°.

COMA. See COMO.

COMA, in Medicine, a preternatural propensity to sleep, though the patient frequently does not sleep, or if he does, awakes without relief. If sleep continues, the disease is called *coma profundum;* in this case the patient continues in a profound sleep, and when awaked, immediately relapses, without being able to keep open his eyes. If he does not sleep, but is continually awakened with frightful dreams, it is called *coma vigilia;* in this case he appears to sleep, having his eyes continually shut. Coma is produced by debility, by the want of food, extreme, &c. See APPHLE.

COMA, in Botany, from *epin,* a head of hair, is applied to a leafy crown, whether of the proper leaves of the plant, or of branches, rising above the fructification. In the place where the crown is, it is of the tender kind; *Coma huminum*, or purple topped clary, of the latter, being more elegantly elegant with pink or purple. See Comine.

COMA, in Astronomy, *fruits comala folius angustissimis triloba.* Burn. See *Athanasia crithmisaria.*
COMA, in Astronomy, *fruits comala folius inferioribus incaulis, Comm. See *Athanasia dentata.*
COMA, in Astronomy, *fruits comala erice foliis, Comm. See Chrysocoma ciliaris.*
COMA, in Astronomy, *fruits comala folius erice marina, Comm. See *Athanasia crithmisaria.*
COMA, in Astronomy, *fruits comala folius fruticosus marina, Comm. See *Chrysocoma ciliaria.*
COMA, in Astronomy, *fruits comala folius glauces in extremitatibus trifoliis, Comm. See *Athanasia crithmisaria.*
COMA, in Astronomy, *fruits comala fruticosus folius multiformis glaucii, Burn. See *Athanasia crithmisaria.*

COMA, in Astronomy, a town of Venetia.

COMAGIENA. See COMAGINE.

COMAGINE, a place of Noves, dillant, according to Antonium's itinerary, 24 miles from mount Cetius.

COMANA, a town of Pontus, seated on the river Iris, towards the mountain of Paryade, on the north. It was famous for a temple of Bellona. The town and territory depended on a pointil, who, on solemn days, wore a diadem, and possessed a kind of sovereignty. Venus also was worshipped in this city: here was celebrated with great magnificence, and the had many courtizens.

COMANA, a town of Asia, in the greater Cappadocia, fented on the river Sarus, in Cappadocia. It was also called Chrysa, and be the appellation of Cappadocian.

COMANA, or BZOSA, a town of the island of Taprobana, according to Ptolemy.

COMANA, or COMNACIUS, a town of Asia, in Phrygia. - Also, another town in Phrygia. Ptolemy.

COMANA, in Geography, a town of South America, in the northern division of Terra Firma. It lies on the north-callerimost part of the sea-coast.

COMANCES, or HILTANUS, a tribe of Indians in Louisiana in America, who have no fixed place of residence, and who have neither towns nor villages. They are divided into many hordes, that they have scarcely any knowledge of one another. They never continue in the same place for more than a few days, but follow the buffalo, the deer of which is their principal food. Some of them purchase of the Pous or Touskies, another tribe, corn, beans, and pumpkins; but their number is so great, that these articles furnish a small quantity of their food. Their tents are made of...
of skins neatly dressed, and fashioned in the form of a coat, affording room for a family of 10 or 12 persons; those of the chiefs are capable of accommodating 50 or 65 persons. When they pitch their tents, they form regular streets and squares, exhibiting a fort of town suddenly raised, as it were by incantation, and at a signal for march, they are as suddenly struck: to every tent are allotted two horses or mules, one for carrying the tent, and another for removing the poles or stakes, which are mostly made of red cedar; they all travel on horseback. Their horses are tied for grazing with a long halter, and they are so numerous as to require frequent change of place. Their horses are so managed, as to be remarkably dexterous and gentle. It is their practice to hunt the buffalo on horseback; and they kill this animal with the bow, or a sharp stick like a spear, which they carry in their hands. They are generally at war with the Spaniards, committing frequent depredations upon the inhabitants of Santa Fé and St. Antoine; but they have been always friendly and civil to any French or Americans who have been amongst them. With regard to their persons, they are strong and athletic, and, in advanced life, corpulent. As savages, they are uncommonly clean; the dresses of their women is a long loose robe, reaching from the chin to the ground, tied round with a fancy fast or girdle, all neatly made of dressed leather, on which they paint figures of different colours and significations: the dresses of the men consists of close leather pantaloons, and a hunting shirt, or frock of the same. Their attire in the dance place does not admit of their making any plantation; but the small Cayenne pepper grows spontaneously in the country, and with this, together with some wild herbs and fruits, particularly a bean that grows plentifully on a small tree, resembling a willow, called Mapete, the women cook their buffalo beef in a manner that renders it grateful food. They alternately occupy the immense space of country from the Trinity and Braces, crossing the Red river, to the heads of Arkania and Misfouri, to river Grand, and beyond it, about Santa Fé, and over the dividing ridge on the waters of the Western Ocean, where, as they say, they have seen vessels, which they describe as ships, with sails and rigging. Their native language differs from that of any other nation; but they have a mode of making themselves understood to the Indians by signs. Amongst them are many Spanish men and women, who are slaves, and who were made prisoners by them in their youth.

COMANI, in Ancient Geography, a people of Asia, probably of Scythia, who inhabited the country Comania, mentioned by Piny. They were probably the same the fame with the Com of Ptolemy, and the Comari and Comami, placed by Pomponius Mela in the vicinity of the Paropamisians.

COMANIA, a country of Asia, according to Xenophon. See COMANIA.

COMANIA, also called Daghestan, a country in the northern part of Turkey in Asia, south from Little Tartary, and north from Georgia bounded on the east by the Caspian sea, W. by the Caucasus, N. by Circassia, and S. by Kirwan. Its inhabitants are known by the name of Comamses. See DAGHESTAN.

COMANNA, an inland country of Africa, on the Slave coast, bounded on the east by Infoko, on the south by Lobadde and Ningo, two provinces of Aquambo; its northern limit is unknown. Little is known of the country, except that its natives bring great quantities of gold to the markets of Akkaradi, a kingdom touching it on the west, who affords bread carry it to Aboni, and then to the negros of the sea-coast. Beyond Comanna, in regular succession from E. to W., but with unascertained boundaries to S. and N., are the kingdoms of Lathi, Equa, Bonu, situated far north; Tahi, Quaka, Aboni, Sankug, Agum, and Achem, all supposed to be rich in gold; but more especially Quaka.

COMARCHIOS, in Antiquity, the name of a particular air, or tune, designed to be sung at entertainments.

COMARGO, in Geography, a town of North America, in New Leon, Situate on the south side of Rio Bravo, which empties itself into the gulf of Mexico on the west side.

COMARIA PROMONTORIUM, in Ancient Geography, a maritime place of India, at the extremity of the peninsula, on this side of the Ganges. See Cape COMARIN.

COMARIS, in Lichology, a genus given by the Greek writers to the sejunctae, or asplenoce.

COMAROIDES, in Botany, alpina argenteum; Segal.

See Potentilla nigula.

COMARTCH, in Geography, a river of South Wales, in the county of Brecknock, which runs into the Yvon, eight miles W. of Buich.


Gen. Ch. Cad. Perianth one-leafed, ten-eleft, very large, spreading, coloured, permanent; alternate segments smaller, inferior. Cor. Petals five, oblong, acuminate, inserted on the calyx, much smaller. Stam. Filaments about twenty,awl-shaped, inserted into the calyx, length of the corollis, permanent; anthers crenate-shaped, deciduous. Ped. Germs numerous, roundish, very small, collected into a head; styles simple, short, from the middle of the germ; frigmas simple. Peric. none. Seeds naked, even-surfaced; attached to a large, egg-shaped, fpongy, villous, perforating receptacle.


COMARUS PORTUS, in Ancient Geography, a name given by Dion Cassius to a port of Epirus, which he places in the gulf of Ambrocia. Strabo calls it Comarus Sinus, and makes it a small gulf of Epirus.

COMAYUAGUA, or VALLADOLID, in Geography, a large town of the province of Honduras, in Old Mexico, or New Spain, in North America, on a river which falls into the gulf of Honduras. It is the see of a bishop, and has rich silver mines in its neighbourhood; 90 miles S.E. of Truxillo. E. long. 80° 4'. N. lat. 14° 30'.
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inch in diameter; this arbor is mounted between two circular brass plates. II, fig. 1, connected by three pillars, it carries as many circular filed cutters, or faws, K, fig. 4, as the comb to be cut is to have teeth. M, fig. 5, represents another arbor, which is fixed in the frame-plate, fig. 1, by its ends; it is triangular, and has a piece of filet, L, fig. 4 (called a guide), fixed on it between each faw, on the arbor, b. These parts are put together by first putting the end of the arbor, b, fig. 2, through the hole in the centre of the frame-plate, I, and screwing on the catch, a; the end of the arbor fig. 5, is put into a square hole made in the plate, I, and is fixed by a screw; a guide, L, fig. 4, is then put on the arbor, M, close against the shoulder, d; next a cutter, K, is put on the arbor, b, touching its shoulder, e; a piece of filet plate, N, called a guide-washer, is then put on the arbor, M, and another guide, L, close to it; the guide-washer is a little thicker than the cutter opposite it, so that the cutters each turn between two guides without touching them. These being in their places, a small washer, O, fig. 4, is put on the arbor, b, and a cutter, then a guide-washer and guide, on the arbor, M, and so on alternately, till the greater number of cutters are put on; the filet shoulder, f, is then taken, and with the octagonal nut, g, screwed fast up against the last cutter, put on the arbor, b, this will pinch all the cutters and washers between the shoulders, e and f, and hold them fast. The fame: is done to the arbor of the guides, and, lastly, the frame-plate, H, is put on the ends of the pillars, and screwed fast; the whole forming the frame-plate shown in fig. 1. The frame plates with the arbores, as in fig. 1, are now to be put in their place in the machine, fig. 3, the horns of the catch, a, going into two holes in the pulley, F, and the other end of the arbor, b, into a centre that goes up with a screw in the puppet, Q; the screws, b, are designed to steady the frame-plates (which hold the arbor of the guides) against the dove-tail, P, supported by brackets projecting from the front of the clock, sufficiently to let the block, i, which slides in the dove-tail, and holds the comb, be drawn forwards to give room for the hand to put in or take out the combs clear of the cutter. To the base of the dove-tail is screwed a plate, holding one of the centres for a worm wheel, k, whose axis is made of filet, and has its end cut with a deep thread-screw; the screw-end of this axis works in a centre, fixed to the base of the dove-tail, and the block, i, is cut away to pass clear over it and the threads of the screws, without touching them. The worm-wheel, k, is turned by an endless screw, on the arbor of the wheel, r, which receives its motion from the pulley, t, by an endless line. The block, i, which holds the comb, moves in the dove-tail, and is to carry the comb towards the cutters while cutting. As the screw on the axis of the wheel, K, is to carry the block up in its nut; a knife-edge, fastened to a small lever, l, movable on a centre in the face of the block, is applied to it, and kept down (so that the knife-edge may take into the threads of the screw) by a catch similar to the latch of a door, which is released by pulling in a thumb-fluid, and allows the spring, a, to throw up the lever, l, and disengage the screw, so that the block may be brought forwards in the dove-tail. The piece of ivory intended to be cut is put under a plate, p, and held down by two screws to the face of the block, which is in the same plane with the arbor of the cutters; the workman then puts down the knife-edge, and the catch keeps it to; he then turns the machine by his foot, and pushes the block towards the cutters (the comb sliding close on the guides) till the knife-edge take the slide thread of the screw, which it must round as before described, and pushes the block and comb up to the cutters, as far as the
the fore extends, and the cutters saw the teeth in the comb;
the thumb and is then pulled in, and the spring, o, throws
the knife-edge up, so that the block can be brought back by
hand, and the comb taken out. The distance which the
comb projects from the face of the block towards the cutters,
and consequently the length of the teeth, is regulated by a
straight edge of metal on the top of the block, i, under the
plate, p, against which the back of the comb rests; it can
be moved parallel to itself across the top of the block by
two screws, (which are seen at the upper corners of the face
of the blocks), for combs of longer or shorter teeth. The
handle of the comb has a wheel. R, on it, turning an arbor,
s, by a line, which carries a set of cutters for pointing the
comb. The arbor is shown separately in fig. 6, and a cutter
in fig. 7; it is made up in the same manner as the former
one, and followed by a screw, T; the ends of the teeth of
the comb are applied to this cutter by hand, first on one side,
and then on the other, till the points are made. This is
performed to one comb, while the teeth are cutting in
another.

Comb, or Coomb, in Hydraulics, a measure of corn, con-
forming to 2 long strakes = 4 Wincheller bushels = 16
pecks = 32 dry gallons = 128 dry quarts = 256 dry
pints = 860.16 cubic inches = 4.97 cubic feet =
1.843621 cubic yards = 17,321.42 cubic links; in some
places the bushel contains eight gallons and a quart.

Comb, or Coomb, in Carnook, of wheat, according to the
9th and 11th Henry III. 12th Henry VII., &c., was 2706.
troy = 210.9514 lb. windropic = 2 strakes = 16 pecks
= 32 gallons = 256 pints or pounds.

Comb, in Ornithology, the crest, or red flabby tuft growing
on the head of a cock.
Comb, in a floor, a little piece of timber, set under the
lower part of the back-level near the middle: it has two
holes in it, and supplies to the fore-tacks, what the chet-
trees do to the main-tacks; that is to bring the main-tacks
aboard.

Comb, in the Manufacture of Tapestry. See TAPESTRY.

COMBA-MARTIN, in Geography, a town of England, on the
north coast of Devonshire, in the Briduil channel, with a
small creek for boats; near it are silver-mines, which
formerly yielded a considerable quantity of ore; 39 miles
W. of Bridgewater, and 176 W. of London.

COMBA, in Ancient Geography, a town of Asia Minor,
in the interior of Lycaia, and in the vicinity of Mount
Cragus. Ptolemy.—Aio, a marlch of Greece, in Macedonia,
near mount Athos, mentioned by Athenaeus.

COMBAMIEE, in Geography, a considerable river of South
Carolina, which enters St. Helena Sound, between Cooba
and Aheepoo rivers. The ferry of the same name on this
river is distant 17 miles from Jackson's borough; 15 from
Pocotiah, and 52 from Charlton.

COMBAM, or COOM, a town of Hindostan, in the
country of Cuddapah; 85 miles N. of Cuddapah. Com-
ban is reckoned 25 colleges from Tanacordi, and 32 from
Ongole, or about 51 geographical miles from the latter.
Taverner calls it Raman.

COMBAMET, a town of Hindostan, in the country of
Golconda, 268 miles S. of Hydrabad.

COMBANA, or NORMANIA, in Ancient Geography, a
town of Africa, in Carthage, situated near the sea.

CAMBAROSES, in Antiquity, the fellow-barons or
commandy of the Cuque-Patt.

COMBAT, in a general sense, denotes an engagement;
or a difference decided by means of arms.

Authors sometimes distinguish in an army, between a
combat and a battle; the latter expressing the general en-
tation of the whole army; the former only a particular skir-
mish, or engagement of a single part; so that the combat
is properly a part of a battle.

COMBAT, in Law, or single combat, denotes a formal trial,
between two champions, of some doubtful cause or quarrel,
by the sword or halberds.

This form of proceeding was abundantly very frequent,
particularly among the barbarous nations in their original
settlements; and obtained, not only in criminal, but
also in civil causes; being built on a presumption
that God would never grant the victory but to him
who had the best right. It was originally permitted, in or-
to determine points respecting the reputation of individuals,
but afterwards became much more extensive. See Duel.
The form and ceremony of the combat are described in
the grand Coutumier of Normandy. The accouter, full, fiowerte
to the truth of his accusation in; the accouter gare him the
lie; upon which, each threw down a page, or pledge of
battle; and the parties were committed prisoners to the
day of combat. See CHAMPION.

If florians tell us, that Alphonso, king of Castile, in the
eleventh century, desiring to abolish the Molca bic liturgy,
and to introduce the Roman office; the people
opposing it, he was agreed to terminate the difference by
combat, and leave the cause to the decision of Heaven.
One of the earliest restrictions of this practice that occurs
in the history of Europe, is that of Henry I. of England;
which was afterwards followed by an edict of Louis VII.
of France to the same effect. Robertson's Hist. of Chalce.
Vol. v. p. 61, &c., and 350. &c. 8vo.

COMBAT is also used for the solemn games of the ancient
Greeks and Romans, performed in honour of their gods;
as the Olympic games, Pythian, Isthmian, and Nemean
games; the hith Atian, Circenid, &c. which fee in their
places, OLYMPIC, ISTMHUS, &c.

The combats here celebrated, were running, wrestling,
bowing, eoufus, &c. The combattants, who were called athletes,
prepared themselves for it from youth, by combat
exercise, and a very rigid regimen: they only eat certain
things, and at certain hours; drank no wine; had no com-
merce with women; and both their labour and their rest
were regulated.

COMBATANT, in Heraldry, termed by the French
heralds confronté, when two animals are borne in com-
bat, in a fighting posture, erect on their hind feet, and
facing each other.

COMBATANT, in Ornithology, the name given by
French writers to the Linmeau Tringa pagana, the bird
known in this country by the name of Kufft and Keever,
the male being called the Kuff, the female Keever. See
Tringa pagana.

COMBEAUFONTE, a small town of France, in
the department of Upper Saone, chief place of a canton,
in the district of Veroil. It contains 583 and the canton
7356 inhabitants. The territory includes 190 kilometres
and 17 communes.

COMBETIS, FRANCIS, in Biography, a learned French
monk, was born at Guimene, in the year 1665. He pursued
his studies first under the Jesuits at Bourdeaux, and after
wards at Paris. He devoted himself principally to the pur-
pose of Greek literature, and was employed in editing new
editions of the Greek fathers, for which he received a very
handsome remuneration. He likewise published a collection
of the lives of different fathers, prophet, and martyrs; some
additions to the " Bibliotheca Graecoum Patrum," in
Greek and Latin, in three volumes folio; "Historia Briz-
zantinum Scriptorium, post Theophanem," undertaken by
command
command of the celebrated Colbert. He died in 1679 of the stone, a disease to which fluminous and sedentary men are peculiarly liable. \textit{Nat. Diit. Brit.}

COMBANY, in Geography, a river of South Wales, in Carmarthenshire, which discharges itself into the Loughor, 5 miles N.E. of Llanelli.

COMBER, THOMAS, in Biography, was born at Wetheram in Kent, in the year 1645, where he received the rudiments of a learned education; from thence he was admitted to Eton College Cambridge. He was remarkable for diligence in his studies, and took his degrees of B. of arts in 1665, and of Master of Arts in 1666. Some years afterwards he was created doctor of divinity, probably by a diploma from Lambeth. After this, he attained to considerable rank in the church, and was preferred to the precentorship of York, the deanery of Durham, to be chaplain to their majesties, and other posts of emolument and honour. Dr. Comber maintained a correspondence with Tullotson, Burnet, and other most eminent divines of the age in which he flourished. The excellence of his character, and his zeal for the church of which he was a member, were the causes that led him to that distinction to which he attained, and which was a sure earnest and pledge of still greater preferment if he had lived, but he died in November 1699, in the 55th year of his age, and was buried at Stonegrave in Yorkshire, of which he was rector. He was author of many learned works relating principally to the Common Prayer, and to the offices of the Church of England.

There was also another Dr. Thomas Comber, born in Suffolk, Jan. 1575, who was educated in Trinity College Cambridge, and afterwards made dean of Carlisle. In 1642 he was imprisoned, plundered, and deprived of all his preferments, and died at Cambridge in 1653. He is known as the author of "An Historical Vindication of the Divine Right of Tythes," 4to, written in answer to "Selden's History of Tythes," Basingstoke, England.

COMBER, in Ichthyology, a species of wrasse or old of fith, found sometimes on the coast of Cornwall, and which is described under this name in Ray's Synopsis, No. 163. See Labrus Comber.

COMBER-MERE, in Geography, a lake in the county of Chester, on the borders of Shropshire; five miles S. of Nantwich.

COMBINATION, properly understood of an amalgamation of several things by two and two; but is more particularly used in \textit{Mathematics}, to denote the variation, or alternation of any number of quantities, letters, sounds, or the like, in all the different manners possible.

P. Merian gives us the combination of all the notes and sounds in music, as far as sixty-four; the sum whereof amounts to ninety figures, or places.

The number of possible combinations of the twenty-four letters of the alphabet, taken first two by two, then three by three, &c. according to Mr. Pritchard's calculation, amounts to 13971642888675259903241384965930300.

The words in the following verse may be combined a thousand and twenty-two different ways:

\textit{Tet tilli fonte dores, virga, quot sidera celo.}

F. Truchet, in the Memoirs of the French Academy, fells, that two square pieces, each divided diagonally into two colours, may be arranged and combined sixty-four different ways, so as to form so many different kinds of chequer work, which appears surprising enough, when one considers that two letters, or figures, can only be combined twice. This note may be of use to nations, paviours, &c. See \textit{Pavement}, and \textit{Changes}.

COMBINATION. \textit{doctrine of.}—Any number of quantities being given, together with the number in each combination; to find the number of combinations.

One quantity, we observe, admits of no combination; two, a and b, of one, viz. ab; of three, a, b, c, there are three combinations, viz. \(ab, ac, bc\); of four, \(x, a, b, c\); of five, ten, \(ab, ac, bd, cd\), &c. Hence if the number of things to be combined be \(q\), the side of the number of combinations will be \(q-1\) and therefore the number of combinations \(\frac{q-1}{1} \times q - 0\). See \textit{Triangular number}.

If three quantities are to be combined, and the number in each combination be three, there will be only one combination, \(abc\), if a fourth be added, the combinations will be found \(abc, abd, abd, acc, \) &c. if a fifth, \(ten, abc, ad, \) &c. &c. &c. &c.; if a sixth, twenty, &c. The numbers of combinations, therefore, proceed as 1, 4, 10, 20; i.e. they are the first pyramidal triangular numbers, whose sides differ by two units from the number of given quantities. See \textit{Pyramidal number}.

Hence, if the number of given quantities be \(q\), the side will be \(q-2\); and therefore, the number of combinations \(\frac{q-2}{2} \times q - 1\). See \textit{Triangular number}.

Hence it is easily deduced a general rule for determining the number of combinations in any case: for suppose the number of quantities to be combined, \(q\), the exponent of the combination \(n\), the number of combinations will be \((q-n+1) \times \frac{q-n+2}{2} \times \frac{q-n+3}{3} \times \frac{q-n+4}{4} \times \frac{q-n+5}{5}\) &c. till the number to be added be equal to \(n\).

Suppose, \(v, gr\), the number of quantities to be combined \(v = 6\); the exponent of the combination \(4\); the number of combinations will be \(\frac{6}{1} \times \frac{5}{2} \times \frac{4}{3} \times \frac{3}{2} \times \frac{2}{1} = 15\).

Coral. If it be defined to have all the possible combinations of the given quantities beginning with the combinations of the several two's, proceeding to three, &c. there must be added \(\frac{2}{1} \times q - 0\), \(\frac{2}{1} \times q - 1 \times q - 2\) \(\frac{3}{2} \cdot 3 \cdot 4\) &c. Hence the number of combinations possible will be \(\frac{q+1}{1} \times \frac{q-1}{2} \times \frac{q-2}{3} \times \frac{q-3}{4} \times \frac{q-4}{5}\) &c. which is the sum of the unex of the binomial, raised to the power \(q\) and abridged of the exponent of the power increased by unity, \(q+1\). Wherefore if \(q = 2\) represent the binomial to which these belong, \(2^q - 1 - 1\) is the number of all the possible combinations. \(v, gr\) If the number of quantities be \(q\), the number of possible combinations will be \(q^q = 2^q - 2^q = q = 26\).
2. Any number of quantities being given, to find the number of changes and alternations which these quantities, combined in all the manners possible, can undergo.

Suppose two quantities, \( a \) and \( b \), their variations will be 2; consequntly, as each of these may be combined, even with itself, to these there must be added two variations. The whole number, therefore, will be \( 2 + 2 = 4 \). If there were three quantities, and the exponent of the variations were 2, the combination will be 3, and the changes 3; to which if the three combinations of each quantity with itself \( a, b, c \), be added, we shall have the number of changes, \( 3 + 3 + 3 = 9 \).

In like manner it is evident, if the given quantities were 4, and the exponent 2, the number of changes would be \( 2^4 = 16 \); and, in general, if the number of quantities \( n \), and the exponent \( n \), the number of changes will be \( n^n \). By this proceeding, it will be found that if the number of quantities \( n \), and the exponent \( n \), the number of changes will be \( n^n \); wherefore, if all the antecedents be added, where the exponent is \( k \), the number of possible changes will be \( n^k + n^{k-1} + n^{k-2} + \ldots + n + 1 \), &c. Till at length, the number subtracted from \( n \) leaves 1; because the beginning is from single quantities taken once.

Since then the number of possible changes is in a geometrical progression, whose first or smallest term is \( n \), the greatest \( n^n \), and the ratio \( n \); it will be \( n^{n-1} \).

Suppose, \( n = 4 \), the number of possible changes \( n^{n-1} = 4^{4-1} = 40 \). Suppose, again, \( n = 24 \), the number of possible changes \( n^{n-1} = 24^{24-1} = 340 \).}

COMBING of wool. See Combs.}

COMBINE, to unite, to join together.
COMBS. In Geography, a town of France, in the department of Puy de Dôme, chief place of a canton, in the district of Riom, containing 1508 inhabitants. The territorial extent is of 125 kilometres, with a population of 7580 individuals distributed in 12 communes.

COMBS of Béa. See Honey-camb.

COMBURENDO HERETICO. See Heretic.

COMBUST, in Astronomy. When a planet is in conjunction with the sun, or not distant from it above half their disk; it is said to be combust, or in combustion.

According to Argol, a planet is combust or in combustion, when not above eight degrees and thirty minutes distance from the sun, either before or after him.

COMBUSTA, in Ancient Geography, a town of Gallia Narbonensis, marked in the Itinerary of Antonine, on the route that leads from Narbona to the passage of the Pyrenees.

COMBUSTION pecuniare, the ancient way of trying mixed and corrupt money, by melting it down, upon payments into the Exchequer. In the time of king Henry II., a constitution was made, called the trial by combustion; the practice of which differed little or nothing from the present method of assaying silver. But whether this examination of money by combustion was to reduce an equation of money only or of sterling, viz., a due proportion of alloy with copper, or to reduce it to pure fine silver, does not appear. On making the constitution of trial it was considered that though the money did answer numero et ponderis, it might be deficient in value; because mixed with copper or brass, &c., like Lowndes's Essay upon Coin, p. 5.

COMBUSTION, a fire, a burning, denotes the decomposition of certain substances, which are thereby called combustibles; accompanied with heat and light. The process of combustion, the various phenomena it exhibits, its abluminating effects, its infinite uses, and its devastations, have at all times, rendered it the principal object of human attention in all the various branches of life. The whole extent of civil economy, the preparation of food, as well as almost all the articles of necessity and of luxury, most of the arts of more essential use to mankind, such as the manufactures of metals, of guns, of pharmacy, &c., depend almost entirely upon combustion. The inconvenience of the weather, and the dismal darkness of night, are removed by means of combustion. The most active instruments of destruction depend upon combustion. The grandest scenes of wonder, admiration, and terror, like the confutation of towns, and the eruptions of volcanoes, are those in which combustion is the sole actor.

Whilst the wants and the economy of the multitude, have at all times called forth their industry in devising easy methods of lighting and warming their apartments, of cooking their victuals, &c., the calm contemplations of philosophers have endeavored to investigate the cause or causes, the commencement, the progress, the various intensity, and the products of combustion. It is natural to suppose that their first ideas must have been extremely fanciful and incoherent; since the present theory, which rests upon the foundation of innumerable experiments and strict reasoning, is vastly different from any fort of hypotheses, which even the wisest philosopher would have been led to form, without the light of those experiments.

The first plausible theory of combustion was formed by Stahl, an eminent chemist. The striking difference between bodies combustible and incombustible is, between bodies that are, and those that are not susceptible of combustion; induced him to suppospe that the combustibles were endowed with a peculiar principal of inflammability, which the incombustibles had not, and to this suppossession he gave the name of phlogiston. According to this supposition, when combustibles were heated to a certain degree, they began to part with this phlogiston, and continued to burn as long as they had phlogiston to lose; after which, they remained in a state of incombustibility; hence, in the former state, those bodies were said to be phlogisticated, and in the latter they were said to be dephlogisticated. With certain bodies the combustion was attended with a separation of other components, so that afterwards they could not be brought back to their former state by the mere addition of phlogiston; but with other bodies, as for instance, with the metals, the processes of dephlogistication and phlogistication might be repeated without end. Thus, a piece of zinc in the metallic state was fopposed to be loaded with phlogiston, therefore, when exposed to a sufficient degree of heat, it would burn, viz., it would part with its phlogiston, and would thereby be reduced into the state.
flame of a calx, distillate of phlogiston, and of the metallic appearance; but by placing this calx in contact with bodies which contained abundance of phlogiston, in a proper situation, the calx would thereby be enabled to recover its phlogiston, and with it its metallic state and combustibility. It might then be burnt again, and so forth. This phlogistic theory was no sooner made known, than it was eagerly adopted by philosophers and chemists; so that for a long period it remained the most prevailing theory of combustion. But though the theory was universally adopted, the existence of the principle upon which it was founded could not be proved. There was no exhibiting the phlogiston by itself; and it was merely a supposition that a body acquired or lost its inflammability, according as it was combined with, or deprived of, its phlogiston. A supposition, which, on a closer examination of facts, was found inadequate to the explanation of the concomitant phenomena. For instance, when a piece of zinc (and such was also the cafe with other combustibles as far as they might be subjected to experiments) of a determinate weight, was burnt and reduced to a calx, the weight of the calx was found to exceed the original weight of the zinc. It was, therefore, evident that it had acquired something ponderable, and this was utterly repugnant to the phlogistic theory, for by the loss of phlogiston it ought rather to have lost part of its original weight. In answer to this, a strange idea was suggested, namely, that the phlogiston was a principle of lightness; so that bodies became lighter by the addition of phlogiston and vice versa. But this supposition, so singular and so repugnant to the general laws of gravitation, was soon abandoned by philosophers when a variety of decisive experiments, the concurrence of recent discoveries in other branches of phlogistry, and a fresh mode of reasoning, introduced a new theory of combustion, which is both supported by accurate experiments, and sufficient to account for the phenomena. One of the principal labours in the experimental investigation, and the full establishment of this new and rational theory, was the unfruitful Lavoisier, to whose genius, and to whose persevering industry, the scientific world must ever think itself indebted.

In order to render this theory more easily understood by the reader, we shall prefix the following experiment. Take a glass vessel of a cylindrical shape, having a flappable lid, of excluding the entrance or exit of any air, and at the outside of this vessel be graduated, so as to divide its capacity into pretty small portions. Put into this vessel, full of common air, a piece of dry phosphorus of a determinate weight; close the vessel tight, and heat gradually that part of it in which the piece of phosphorus stands, by means of the flame of a candle. As soon as the phosphorus has been heated to a certain degree, it takes fire of itself, burning with a flame and thick white smoke; but it soon ceases to burn. Suffer the vessel to cool, and the smoke will fall in the form of flakes, if the vessel and the air contained in it were quite dry, otherwise these flakes will settle in the moisture. If, in this experiment, the vessel be weighed before and after the combustion, it will be found precisely of the same weight. When the vessel is cooled to the actual temperature of the atmosphere, plunge the aperture of it under water, and in that situation remove the fl MSS. You will find that the water rises in it, which shows that a portion of the air has been destroyed or absorbed; in short, it has disappeared. By measuring the height of the water risen within the vessel, which is indicated by the graduation on the outside of it; in general, it will be found that about one quarter of the original quantity of air has disappeared; and the remaining air will be found unfit for the combustion of phosphorus or of any other combustible; and likewise unfit for the respiration of animals, so that if a bird, a mouse, or any other animal be confined in it, death will soon ensue. If the water which has rushed into the vessel be examined, it will be found to have contained a four volume indicating that an acid has been generated. If the vessel, instead of being opened in water be inverted and opened in quick-firer, then the flakes which in the preceding experiment were dissolved by the water, will now remain on the surface of the quick-firer. This is the acid of phosphorus, and if it be carefully gathered and weighed, it will be found together with the remaining phosphorus (if part of it remains unburnt), equal to the weight of the original quantity of phosphorus together with the weight of the air that has disappeared. Therefore it is evident that the whole proceeds of combustion consists in a decomposition of the purest part of respirable or atmospheric air; the pure part of it, which is about a quarter of the whole, is decomposed, its base is absorbed by the combustible, and generally communicates to its acid properties, in consequence of which that portion of the atmospheric fluid has been called oxygen gas, from the Greek; meaning the acidifying principle. Therefore, in combustion, the decomposition of the oxygen gas is effected by the burning body, when this body has been heated to a certain degree, which degree varies with the nature of the body. The base of the oxygen gas is able both and fixed by the burning body, which has thereby its weight increased, and its water charged; whilst the calour being disengaged, puffs oil in the state of sulphuric heat, and sometimes with such a portion of sight as gives the appearance of red or white heat. Acids in general are not formed from the absorption of oxygen during combustion. See Oxygen Gas.

When the combustion is accompanied with red heat, but not with flame, it is called ignitition. But ignition may also be applied to incognizable substances, for these may be rendered red or white hot, without suffering any decomposition. When a vapour arising from the heated body burns over it, it is then called inflammation; and when the inflammation is rapid and attended with noise, it is called detonation. Having now comprehensively stated the new theory of combustion, it is now easy to add several necessary remarks respecting every part of it, which could not be intermixed with the theory without rendering it confused and less intelligible.

In the next place, since the process of combustion consists in a decomposition of oxygen gas, the universal spirit of modern phlogistry includes every process, in which oxygen gas is decomposed, under the general name of combustion; thus, animal respiration, in which this gas is decomposed, its base absorbed, and heat evolved; may be reckoned amongst the processes of low combustion. See Respiration. The gradual absorption of oxygen by metallic bodies may also be reckoned amongst these processes.

Since combustion consists in a decomposition of oxygen gas, it naturally follows that without oxygen no combustion can take place. The oxygen, however, may be contained in other substances, in consequence of which those substances become capable of supplying combustion. Now there are seven of their substances, which, from their containing oxygen, are called combustibles; and these are oxygen gas, atmospheric air, nitrous oxys, nitric oxyd, which is prepared by digesting copper and mercury in diluted nitrous acid, and collecting the gas which is extracted, nitric acid, oxygenized me
riatic acid, and hyperoxygenezed mariatic acid. See the
nature of those substances under the article Gas. It also
follows that with a given combustible, the quickness of the
decomposition is proportionate to the supply of oxygen,
which flows the reason why a fire is increased by blowing
common air, and much more by blowing oxygen gas upon
it. But consider paniers with different combustibles, the
fire is strongest when the combustible has the stronger
traction for oxygen. The flame of hydrogen gas agired by
oxygen gas is reckoned to produce the most intense heat.

A combustible body, though exposed to oxygen, generally
requires to be heated to a certain degree before the combustion
commences. That degree varies with the nature of the body,
and the purity of the oxygen; so much so that some of
them, though not many, take fire immediately on being
exposed to some of the above-mentioned supporters of com-
bustion in the common temperature of the atmosphere,
whilst others must be heated to a red and even to a white
heat, before the combustion takes place.

When the combustion has once commenced, the heat or
calorie, in the form of sensible heat, which is extricated
from the oxygen gas, raises the temperature of the adjacent
parts of the combustible to that degree which is necessary
for its combustion, and the heat evolved by the burning of this
part heats the next and so on. But this is not the case
with all sorts of combustibles; for some there are which
must be kept up at a given high temperature in order to
effet their combustion, and a diamond is of this sort.

However the nature of combustibles in this respect varies
according to the purity and quantity of oxygen. For instance, if
a slender piece of wire be exposed to the flame of a candle in common
air, that part of it only will burn, which is acted upon immedi-
ately by the flame: but if the flame be lighted by means of a bit of tinder, and then be plunged in a vessel
full of oxygen gas, it will burn successively to the very end,
lke a-hip of paper; exhibiting a remarkable bright light,
and very considerable heat.

Of the simple bodies of nature, the chemists reckon
three combustible ones, and two that are incombustible.
The former are sulphur, phosphorus, and hydrogen; and the
latter are azote and mariatic acid; but amongst the
compound bodies, the combustibles are much more numerous.
Such are oils, acids, and a va-It variety of others which being
of a fluctuating nature need not be particularly specified.

A variety of experiments, which may be found under the article Gas, prove that gasses owe their clastic nature to a
certain quantity of caloric, in which must necessarily combine
with their bafe, in order to assume the aerial form. Therefore,
when, in consequence of the superior affinity of the
combustible for oxygen, the oxygen gas is decomposed,
and its bafe condensed, the caloric, which was necessary to
its aerial form, being set at liberty, appears in the form of
sensible heat; hence the heat which accompanies combustion
is naturally supposed to proceed from the oxygen gas
and the quantity of it varies according to the rapidity of the
processes, so much so that in certain processes like the decom-
position of oxygen effected by metallic substan-
ces in common air, it is not attended with any sensible degree of
heat; for the heat evolved, being very light, is instantly dis-
fipated among the surrounding bodies.

With certain combustible bodies a peculiar process takes
place. It is a remarkable slow process of spontaneous
combustion. The body, by attracting oxygen from the
atmosphere, becomes thereby gently heated; in consequence
of which its affinity to oxygen is increased, a greater de-
composition of the latter takes place, more heat is evolved,
and thus the process is gradually accelerated until flame and
visible combustion take place. Such is sometimes the case
with hay, the sawdust of certain woods, and various other
substances. The well known mixture of iron filings and
fulphur moistened with a little water, is an instance of this
sort; for if this mixture be buried a little below the surface
of the ground, it will of itself, after the lapse of several
hours, burst forth in a late of ignition. This experiment
has been generally called the artificial volume.

Though heat in combustion is derived from the oxygen
gas, the derivation of light is not so evident. It has
been for a long time supposed that this element also
was one of the components of oxygen gas; but the
observations made respecting the light yielded by se-
veral bodies when they are lightly heated, or even spontaneous,
and that some of them yield much more light than others, seem to prove, that light forms a compo-
nent principle of most bodies, and that it is evolved from
the combustible. It is likely, however, that part of it may
be derived from the oxygen also.

The following list of bodies subject to spontaneous in-
flammation is given by professor Barthold: meaning the in-
flammation occasioned by different bodies acting upon each
other, without the aid of another body previously in a state
of combustion.

1. Friction. Thus pieces of wood rubbed against each
other are thereby inflamed. The bell for this purpose are
box-wood rubbed against mulberry, or Laurel against poplar,
or against ivy, &c. It is in consequence of friction that the
wheels and axletrees of carriages sometimes take fire, when
they are not sufficiently greased. In burning also, pieces of
wood sometimes take fire.

2. The action of the sun's rays concentrated by len-
ses, or concave reflectors, or even by plane reflectors, provided
their reflections be thrown upon the same spot. See Burn-
ing Glasses, and Reflectors.

3. The sudden flashing of quicktime has sometimes
been known to produce the combustion of adjacent bodies.

4. The fermentation of animal and vegetable sub-
stances. Thus great accumulations of hay, turf, or flax, and hemp,
heaps of linen rags in paper mills, &c. take fire, provided
they are not quite dry; for without moisture, fermenta-
tion and the consequent evolution of heat cannot take
place.

5. The accumulation of animal and vegetable sub-
stances covered with an oil, especially when the oil is of a drying
quality. Thus lamp-black mixed with linseed oil is apt to
take fire, and an earth of a brown colour, called the block
of Dunsford, sprinkled over with a little linseed oil,
takes fire and appears red-hot like burning small coal, in
about an hour's time.

6. There are several substances, which have the property
of inflaming spontaneously, increased by torrefaction.
Coffee, French beans, lentils, &c. are of this nature.

7. Sulphurated and sulphated hydrogen gas. The
causes of subterraneous fires and volcanoes in general, is attri-
buted to the decomposition of pyrites, or metallic sulphur-
cets, buried in the interior of the earth. These pyritic
masses are decomposed by the contact and concurrence of
water and air, and the decomposition is always accompanied
with a great extraction of caloric, and a disengagement of a
very inflammable gas, called sulphurated hydrogen gas.
This gas 1-flames at an elevated temperature, and com-
municates the inflamation to the sulphur of the pyrites, to
the coal and other bituminous matters, which generally ac-
company it.

8. Sulphur and phosphorus of lime and of potash,
formed in the combustion of several vegetables.

The last particulars which we need take notice of, concerning the theory of combustion, are its products. But there must not be mistaken for those bodies which existed in certain combustibles, and have been left by them, as when the other components of the combustible have been separated, such as everly particles, &c. The real products of combustion are those which did not exist before, and these upon a first examination, will be found to be either water, or an oxide, or an acid. Water consists of oxygen and hydrogen. See Water. An oxide is a compound of the combustible with oxygen, but not such as to possess dashed acid properties, (and this oxide is called oxidation); or an acid, which consists of the acidifiable part of the combustible, combined with oxygen. Closely to give it decided acid properties. Thus, the combination of carbon and oxygen forms the carbonic acid gas, and this is produced in almost every combustion, also in respiration, &c.

COMCHE, in Geography, a town of Persia, where the caravans rest in their way from Ithyra to Ormus.

COME, in Biography. See Caesar.

COME. The tail of or tails of mat, upon its first flessing forth, is thus called.

COME IN. Soldiers are said to come in as recruits, volunteers, &c. when they come to join any particular corps or battalion.

COME-OVER. When men differ from one army and join another opposed to it, they are said to come over to the one, which they join or go over to.

To come in to, to join, to bring aid or assistance.

To come up with, to overtake.

COME FRAPE, in the Iliad, has, literally signifies as above, and is used when any foregoing part is to be repeated.

COME IN, in Ancient Geography, a place of European Metropolis, which was an episcopal see, called by the council of Nice, Conceriz.

COMEDAE, a people of Scythia, confpired by Tis.cky, under the general name of Saec.

COMEDONES, a name given to a species of worm, with which the children of Minna, and some other countries, are terrably afflicted; and of which Hoffman, in his "Treatise of Endemic Diseases," gives this account; children in the country are frequently fized with a fort of tabs, which so destroys their flesh, that they appear merely like skeletons. The common people generally suppost these children to be under the influence of witches, but such as have inquired more narrowly into the subject, have found that it is owing to certain worms, resembling black hairs or cords, lodged under the skin. When the skin is rubbed with honey, in a bath, or any warm place, they will appear and come out; but when it is contractcd by cold, they keep concealed within. See Affection Ecima, and Dracunculi.

COMEDY, in its proper sense, signifies an allegorical representation of some characteristic passions in private life. The drama, under its various forms, has in all ages and countries been cultivated, not only as a rational and polite amusement, but as a serious art, affecting the moral conduct of men, and influencing the education of society. According to the field it occupies, whether the lighter traits of incidental character, or the important events of life, it assumes the form of tragedy or comedy. The first commands awe; the last excites more pleasureable and exhilarating sensations. The first exhibits the fall of a hero; the last conducts the fortunes of lovers to the goal of marriage, and sets down the eccentricities of every character it meets with on the way. If therefore tragedy is more exalted, comedy comes closer to the heart, and appeals more powerfully to the experience of man. The stronger passions, the virtues, the crimes, the sufferings of mankind are the theme of the one; our humours, our follies, the effervescence of youth, or the severity of years the topics of the other. Terror and pity are the instruments of pleasure in the first, but ridicule in the last.

It is therefore very easy to discriminate the general spirit and strain of comedy from that of tragedy. Neither is it more moral or less so than tragedy considered as a faithful exhibition of human life, with all its improprieties and absurdities. There is nothing in the nature of these compositions, in either kind, which militates against good morals; though a French author endeavoured to fix the imitation of a preface and antichristian spirit on the great Corneille. The improvement of manners, the regulation of fould int rueure, the subjection of vicious conceptions to the laws of religion, are among the benefits resulting from this species of poetry. R. dice often succeeds where argument fails. Yet it is a dangerous weapon, when unskillfully wielded. For it is by no means the test of truth. It may be applied to muld ad and deceiving, instead of reforming; and the blended colours of ideology are sometimes more difficult to detect, than the lurid lights and shades of truth and error. Cicero quotes some lines of a comedy, where love is represented as the greatest of the deities. Of the strength of this sentiment, he exclaims loudly against all comic poetry as a corrector of morals; contending at the same time, that the art could not exist, if it had not vanity or ridicule to feed upon. Besides this, it happens too frequently, that the ridicule aims where it is least deserved. This, however, is the fault of the writer, and not to be imputed to the nature of the subject. It depends on the conduct, whether the comic shall be drawn in a good cause, or is a bad one. The success of stage representations gave rise to the ancient comedy at Athens. In the latter, as well as in the former, t' unity of action and subject is absolutely requisite, and these of time and place should be as nearly as possible preserved. By this is meant, that the time of action should be reduced to moderate limits, and the pace never changed but with the termination of the act. The scenes of conversation must be united in a natural succession, and the stage should be perpetually occupied during the continuance of the act. The audience should likewise be made to perceive the necessity of the various personages appearing and disappearing just as they do. By these means, the imitation is allied to probability, and the places in proportion. Probability is indeed more indispensably necessary in comedy, which depends on ordinary life, than in tragedy. Nature, whether in the management of the incidents, or the delineation of character and sentiments, is in the only solid foundation for the art of writing. The scene and subject of comedy should be laid in the country and time, where and when it is to be represented. The little proprieties or idiosyncrasies of character and behaviour vary with the moment, and become unintelligible or non-existent, except where they are seen and known in real life.

The various personages in a well managed comedy ought to be distinctly marked, without the stiff station of controlling them by pairs. Ordinary writers may seem to require a strong light and shadow by quaint artifices like those; but a matter looks no better than real life, and represents it as it is. The action should be easy, natural, and polished, on a level with the conversation of gentlemen in the higher walks, but above the profanities of the vulgar in the lower. Perhaps there is nothing in the art so difficult, as to support a spirit and happy dialogue. The parade of misplaced wit has spoofed almost as many comedies as actual delusion.
COMEDY.

The feast of Bacchus, Safforion on his flag, and Theopis in his cart, are the humble origin usually ascribed to the drama. Safforion represented his first piece toward the year 550 B. C. Theopis made his first attempts tragically, and added his Aeschylis in 550 B. C. The former attacked the vices and absurdities of his time; and the latter treated more noble subjects, which he took from history. Sixty

Drama and Theatre. Comedy had three flags among the Greeks. The ancients indulged in the licence, not only of dramatizing actual and well-known occurrences, but of identifying them with living persons. The name even of Socrates was not withheld from theatrical ridicule; and, the philosopher was among the number of the audience. This licence in process of time was intruded by the authority of the magistrates. The players no longer sought liberty to sport with real names, contrived masks to resemble the features of those whom they meant to attack: this was the middle comedy. This latter abuse was severely felt by the former; and was at length prohibited. Depredation of names as well as of names, the new comedy confined itself within those modest and moral bounds, which Menander set to its irregularities in the time of Alexander the Great. On this mode, Plautus and Terence formed their style, without taking the trouble of tracing even the scene to their own country. Their pieces of entertainment were then fearfully naturalized among the Romans; and their performances were rather translations than original works. In the course of time, Rome distinguished its comedy, founded on native manners, by the name of Comedia Togata, and that which was borrowed from the Greeks, was distinguished as the Comedia Palliana.

Before the introduction of modern comedy, a species of dramatic representation was in vogue, taken from the stories in the Old and New Testament, the Martyrology of the Saints, and other religious subjects. They were called mysteries: as the mystery or the Play of the Passion, the mystery of the Acts of the Apostles, the mystery of the Apocalypse, &c. These entertainments were at first given in the churches, and made a part of the ecclesiastical ceremonies. Afterwards the mysteries were played on a public stage. On the entrance of Charles VII. into Paris in the year 1437, scaffolds were erected all along the great street, St. Denys's, on which were acted, with splendid and appropriate decorations, the Annunciation of the Blessed Virgin, the Nativity, our Lord's Passion, his Resurrection, the day of Pentecost, and the last Judgment. In the year 1487, the chapter of the cathedral at Lyons voted sixty livres to the performers in the mystery of Jesus Christ's passion. About 1542, the same city exhibited on Sundays and holidays, for the space of three or four years, the greater part of the historical facts in the Old and New Testament, succeeded by a farce, in the same manner as in our theatres. The popular name of the play-honour was Paradise. These farced comedies were much in fashion in France under Francis I. who patronized them, and attended their representation. One of these, which attracted his approbation, was entitled the mystery of the passion of our Lord and Saviour Jesus Christ. It is said in the title-page to have been performed "triumphantly at Angiers," and indeed so it must have been; for there were one hundred and forty-one characters in the dramatis persona. The date of it is 1541. But the abuses to which these religious performances gave rise occasioned at length a very severe law throughout the kingdom, against the exhibition of "Our Lord's Passion," and other similar subjects. Many of these pieces are still extant in print.

One of the first objects in modern comedy, is the Spanish theatre, fertile as it has been in dramatic productions. Lopez de Vega, Gyllius, and Calderon, are the principal comic writers of Spain. The "Don Juan," and the "illicit," are said to have written above a thousand plays. But our surprise at their number is heightened when we become acquainted with the nature of the plays. Neither the marquis, nor any other role of dramatic writing is in any degree observed. One piece often contains the plot of a man, the scene is limited to one quarter of the globe. They are for the most part tragic comedies, taken from Spanish history; where war and heroism are most happily mixed up with ridicule and buffoonery. Allegorical and mystical characters, the Pater and the sacred mystery, contribute their jest to the extravagant and unique performances. Yet they are not without strong traits of genius, and much space and of imagination. The characters are sometimes well drawn, and the situations happy. To this writer, more than any other, are the public indebted for that taste for the surprising, which so strongly pervades the modern dramas. It is plain from his own apologies, that Lopez de Vega complied with the whimsical fancies of his countrymen; and that he had been at liberty to have led the tale of his times, instead of following in, his Hecules would have been more natural, his intrigues more life-like, his entanglements and unravellings, and his characters more constantly preferred.

The French comic theatre is in general an excellent school of manners; correct, chaste, and decent. It may well boast of such writers as Regnard, Dufreyne, Dancourt, and Marivaux; but Moliere is the glory of their stage. No writer in any department rose to a higher reputation in the brilliant age of Louis XIV. It may indeed be questioned, whether any comic writer has ever appeared with so many excellencies and so few defects. Vice and folly are the only objects of his satire. Though his characters are often peculiar to his own country and times, the ridicule is applied so judiciously as to leave his theatre with foreign and with politeness. His merit is not concealed at the expense of good morals. The "Misanthropus," and "Tartuffe," are in verse; they therefore rise into greater dignity, and assume the style of elegant satire. In his profe comedies he is more ludicrous. His excellence consists more in the strength of his characters, than in the conduct of his plots. He is occasionally too farcical in his life, and too severe in his verse. "Tartuffe" in the grave comedy, and his "Avare," in the lighter, are usually considered as his masterpieces.

English comedy abounds more in original characters, than the comedy of any other modern nation. Humour is a leading feature in the character of the people. The freedom of our government and manners afford a wider scope to the comic muse, than she is allowed in the declamatory courts of the continent. This boldness has, however, too often degenerated into a licence almost bordering on the immorality of the ancient Greek comedy. But this error has, however, been corrected in later times, and the stage has conformed to the more decent manners of an age which is rapidly discarding the grossness of vice from public view.

It now only remains to give a character of some of our most eminent comic writers. Shakespeare decidedly takes the lead in each department of the drama; but his excellences are so universally felt and understood that it would be superfluous to enter into a criticism of his productions. Of Jonson it will only be necessary to notice a few leading pieces. "Every Man in his Humour" is a play which places this writer fearlessly lower than..."
than the highest, whether we advert to the variety of its characters or the energy of its composition. It is to the credit of the present tale, that it retained possession of the stage, in defiance of its oblique allusions, and antiquated garb. "Every Man out of his Humour" has much left to recommend it than the preceding comedy, though strongly marked in point of character. It has undergone the usual fate of personal satire, to die with the individuals at whom it glanced.

"Cynthia's Revels" and the "Poetaster" are chiefly to be remembered, as having been acted by the children of queen Elizabeth's chapel; a relic of theatrical entertainment after the mode of its ancient institution, when the sacred mysteries were represented by the choir of the church or monastery.

Volpone is perhaps the best of this author's comedies. The language and character are brought up to the highest finish, and the poet exhibits an originality of plot, conception, and execution, which proves that he could throw aside the trammels of the student, and lay claim to the honours of an unaided thinker, as well as those of a successful imitator. The pictures of Volpone and Mosca are finely imagined, and their circumstances most happily delivered. His "Epigrams," "Repetition," and "Alchemist," the merits of which are universally allowed, though the object of its satire has given place to other errors and other follies, we shall form such a constellation of comic genius, as will outshine all composition but that of his illustrious contemporaries. His later pieces, consisting of his "Bartholomew Fair," "Staple of News," "New Inn," "Magnetical Lady," and "Tale of a Tub," rather detract from his reputation than augment it; and prove, what many other dramatic writers would have done well to consider, that faculties devoted to the entertainment of the public will at length be exhausted, without some sources of replenishment from change of scene or circumstances.

The triumvirate, such as was never equalled, before or since, in the republic of letters, was completed by John Fletcher, whose merits are closely blended with those of his associate Beaumont. His genius rather affinities with Shakespeare than with Jonson, to whom he is confessedly inferior in propriety and precision, while he surpasses him in creative powers and poetical fecundity.

The next writer that obtained a large portion of the public favour and attention was Davenant, whose propensity to poetry is said to have appeared sufficiently early in life to attract the favourable notice of Shakespeare, though the great bard died when this young rhymster was only ten years old. What is commonly considered as Davenant's first play was produced in 1629, though he had attempted dramatic composition two or three years before. It is not worth while to enumerate the order or titles of his plays and masques; which were in general well received, and procured his promotion to the laurel, vacant by the death of Jonson, as a reward for the affability with which he directed the diversions of the court, as long as the troubles of the times permitted it to have any. It was to his address, that the people were indebted for the gradual reformation of the rules, after an interregnum of severity and gloom. At first he prevailed on men of taste and learning to countenance a hasty species of dramatic melange, which was allowed because it was bad, by the ignorant bigots who held the reins of empire, while rational and regular plays were absolutely prohibited. But he imperceptibly enlarged his sphere of composition, and after the restoration obtained the patent of the theatre in Lincoln's Inn Fields. The stage is not perhaps more deeply indebted to any man than to Davenant, for the convenience and utility of its arrangements in the manager's department. Besides many less material improvements, it owes to him the introduction of female performers, and painted scenery; and from his revival of "Macbeth" and the "Tempel," may be dated that devotion to embellishment, which has ever since inundated the English stage, and, in the judgment of severe critics, overwhelmed the sense and discernment of the audience. His irregular entertainments, resorted to in the first instance only as substitutes for better things, may indeed be considered as the root of all that theatrical evil, we so gravely condemn, but at the same time so freely encourage. Yet he had the power of bringing forward to the public eye scenery, women, and Betterton.

Maturin was also among the feeling supports of the English drama; of which he may justly be regarded as one of the fathers. His style was rough, manly, and vigorous; he prefixed upon his subject with a few but masterly hands; his wit was acute, and his serious dialogue, according to its subject, firm and impressive, or natural, easy, and interesting.

Dryden did not commence his career as a writer for the theatre, till the thirty-second year of his age; but from that period he kept possession of it, and produced eight and twenty dramas, not indeed without competition or censure, but with a large share of predominant reputation. His first production was the "Wild Gallant," a comedy, which met with no indifferent a reception, that had Dryden been a man of fortune, the stage had never again been benefited by his assistance. He was associated with Davenant, in the alteration of the "Tempest," but he acknowledges the invention and writing of the new characters chiefly to belong to his colleague. We cannot, however, help contemplating the perfections of Shakespeare with affection, when we find that two such powerful minds could produce little or no addition to the effect.

On the character of his comedies, it will not be difficult to decide. He has, himself, acknowledged his inaptitude to that species of composition; and certainly his plays in general have much less merit than his other writings. Yet, after all, he has established a reputation that will never fade, even in this branch of poetry; and his drama of the "Spanish Friar" may be looked upon as an instance of happy coincidence and real ingenuity, in the combination of serious and rible materials. Indeed the unfitness of his comic performances for modern representation arises more from their extreme licentiousness and immorality than from any defect of power.

The comedies of Otway are deservedly excluded from the reading desk as well as from the stage, on account of their undisguised obscenity.

Congreve, at the age of twenty-one, produced the "Old Bachelor," at the theatre in Drury Lane, to amuse himself in a slow recovery from a fit of fickness. It received some requisite touches from the mature judgment of his friends, and Dryden declared that he had never seen such a fine play. The "Double Dealer," and "Love for Love," succeeded it, at an interval of a year each. Five years afterwards his comedy, called the "Way of the World," closed his dramatic labours at a time of life, when writers in general are but beginning their career. The indifferent successes of his masterpiece excited his disgust at the caprices of the public. He never resumed his pen in the service of the theatre, except to write a masque, called the "Judgment of Paris," and
and an opera, called "Semee," which was never repre-
rented; but as his fame rests on his five regular pieces, we
may consider him as loft to the stage, after the unkind re-
ception of a play, which hassince vindicated its station
among the most brilliant ornaments of the drama.

It is on his comedies principally, that Congreve's
reputation subsists. Here, all is luminous, all genuine,
pointed, and original. His men of fashion are gentlemen, 
and even his tops are wits. Congreve is considered as having left
humour and lefts of real life, than his illustrious rivals of the
fock. But, surely "Firefights" abounds with the richest
humour, and that of a description, which, though now anti-
quated, was living and current at the time. Indeed it is an un-
doubted testimony to the happy drawing of this character,
that though it is only recognized by the modern spectator
as a picture of the days that are gone by, it never fails to
excite riviency on the stage in a very powerful degree.
The leading feature of Congreve's genius is wit. Dr.
Johnson says, that he formed a peculiar idea of comic ex-
cellence, which he supposed to consist in gay remarks and
unexpected answers. Now, certainly, in adopting such
a theory of composition, he too much narrowed his own
sphere. Still, however, no more is to be required of a
writer, than what he himself undertakes; and Congreve
performed what he undertook with a brilliancy of succees,
which, with the exception of Mr. Sheridan, has neither been
rivalled nor approached in the revolution of the century that
has elapsed. It has been objected, that "his personages
are a kind of intellectual gladiators; every sentence is to
ward or bite; the contest of smarthen is never inter-
mittent." This remark is undoubtedly true; yet, when we
find Congreve thus formidably enfored for the exuberance
of his wit, it is impossible not to feel as the king of Prussia
did, when he wihibited a certain mad commander to bite some
of his generals.

Could the licentiatunue of Congreve's topics be as easily
justified as the overflows of his gaiety, his fame would
continue to blaze without danger of eclipse. But in truth,
the offence his mule occasions to the purer ears of a more
moral age, has an unhappy tendency to shorten his theatri-
ical existence. The observation applies equally, if not in a
greater degree, to all his witty, but graceless contemporaries;
and it may be remarked on such freedoms in general, that
they create disgust and alienation, at least in some minds,
in a place and on an occasion, where it should be as much
an author's study never to offend any, as occasionally to
please all; consequently though they may increase the num-
ber of temporary plaudits, they infect the vitals of a reputa-
tion, that otherwise might have been immortal, with a
principle of early decay.

To particularize the merits either of Congreve's rivals,
Wycherly, Farquhar, Vanburgh, &c. or the numerous
clain of writers in the succeeding ages, who have culti-
vated the comedie larmoyante, would exceed the limits of this
article. The latter is indeed almost as obsolete as the coarse
but flaring wit of king Charles's days. It has given place to
the diversified portraits and philosophy-run mad of the
German school; a taste from which it is most devoutly to
be wished that the drama may be speedily rescued.

COMENII, in Ancient Geography, a people of Illyria,
according to Ptolemy, adjoining to the Daurntian and Var-
dzani.

COMENITZA, in Geography, a town of European
Turkey, in the province of Epire, 52 miles S.W. of Delfino.

COMENIUS, JOHN ASOS, in Biography, a celebrated
grammarian and divine, was born in the year 1522, in Mo-
navia. He studied at Heborn, and returned to his own
country in 1614, and was appointed rector of a college
there. In 1618 he became pastor of the church at Fulnic,
and was appointed master of the school which had been
lately erected. Here he conceived the idea of an improved
method of teaching the languages, but his writings on this
subject were destroyed in 1621, when the town was taken
and plundered by the Spaniards. In 1624 he retired from
the persecutions inflicted upon the Protestants in Germany,
and to Lefa, a city of Poland, where he devoted himself to the
instruction of young persons in the Latin language; here he
published in 1631 his "Jania Linguarum referata," a work
which obtained for him great reputation, and which was
speedily translated into 12 European languages, and also
into the Arabic, Persian and Mogul languages. He was now
invited into Sweden to take the charge of the public schools in that kingdom, which he declined; and
having published the "Panophilus Prodomus," or "Fore-
runner of Universal Science," he was solicited by the parlia-
ment of England to undertake the reformation of the schools
there. He arrived in London Sept. 1641, but owing to the
civil wars his proposals were neglected, and he went to Swe-
den, and from thence to Elbing in Prussia, where he em-
ployed six years in perfecting his new method of instruc-
tion, but did not meet with sufficient encouragement to induce
him to publish his thoughts on the subject. In 1648 Co-
menius was invited to the court of Sigismund Ragotiski,
prince of Transylvania, where he lived four years, and pro-
posed regulations for the college of Patak, upon the plan of his
Panophobia, from whence he returned to Lefa, and con-
tinued there till 1656, when the town was burnt in the war
between the Swedes and the Poles. On this occasion he lost
all his manuscripts excepting what he had composed on his
Panophobia, and the Apocalypse. He fled into Silesia,
thence to Brandenburg, afterwards to Hamburgh, and
lately to Amsterdam, where he continued till his death, which
happened in 1671. At Amsterdam he published his "New
Method of Teaching," which added nothing to his reputa-
tion, and which the learned Bayle has declared of no worth
whatever in the art of instruction. In this opinion he is
sanctioned by the concurrent voice of the learned in every
succeeding age to the present time.

Comenius was not only intent upon the reformation of
scholastic learning, but he embraced the notions of a speedily
approaching millennium, and pointed out as characters who
were to be eminently distinguished in fulfilling the prophe-
cies, Guiliamus Adolphus, Cromwell, and others, who had
little claim to the honours of a divine mission. Succeeding
events contributed to dissipate, in some measure, the enthu-
siastic notions which he had embraced and cherished. By
some of his contemporaries he was charged with having
possessed more knavery than credibility, but of this there
seems to be no satisfactory evidence. He published "Com-
mentaries on the Apocalypsc," some treatises on the Soci-
nian controversy, and "Historia Fratum Bohemorum," in

COMENOLITARI, in Geography, a country of mo-
dern Greece, which comprises the ancient kingdom of Ma-
cedonia and Thessalia.

COMENSES, in Ancient Geography, a people of Aia
Minor, towards Galatia, according to Pliny. Hardouin
calls them Chomenes, deriving their name from Choma, a
town situated in the interior of Lyca.

COMERCHIN, in Geography, a town of European
Turkey, in the province of Romania; 62 miles E. of Em-
boli.

COMES Nervi Phrenici, in Anatomy, is a small branch
of the internal mammary artery. See Arteries.

COMES,
This opinion, therefore, Aristotle easily overturned; substituting another in its stead. According to Aristotle, comets were only a kind of transient fires or meteors, consisting of exhalations rising to the upper region of the air, and there set on fire; far below the moon's course. But rather is this hypothesis more just than the other: for on this principle, the light of the comet, being independent of the sun, would be suffered every which way, without any appearance of a train; or tail, which is contrary to the phenomena. Moreover, they are observed at the same time in places on the earth very remote from each other. Both the modern astronomers who have measured the distance between the comets and the earth, find that the comets have no sensible diurnal parallax; which could not be, were they not much more remote than the moon, whose parallax is visible; and yet as they have a sensible annual parallax, they are not so remote as the fixed stars. Indeed, there were some, Ptolemy tells us, among the ancients, who, "had juster notions; who took these stars to be perpetual, and believed they moved in their proper orbits; but were never seen, unless when left by the sun." Aristophanes, in his first book of Meteors, mentions this doctrine of the ancient philosophers; and observes, that some of the Indians, called Hyperboreans, said, that a comet is one of the planets, but that they do not appear unless after a long time, and are seen but for a short time, which happens also to Mercury. Aquinas Myndius declared, that he took comets for regular stars; affirming also, that the comets were reckoned by the Chaldeans among the planets, and to have their periods like them. He also ventured to assert, that one day the periods and laws of their motion would be discovered. And more fully Seneque, Quod. Nat. lib. vi. He hid himself, feen at last two comets, one in the reign of Claudius, the other in that of Nero; and that which he saw in his youth, a little before the death of Augustus, which in one place he calls a comet, and in another a prodigy. He intimates that he thought them above the moon, and argues strongly against those who imagined that they were meteors elevated into the air by winds, or who held some other absurd opinions concerning them. "I am not of the common opinion," says he, "nor do I take a comet to be a sudden fire, but esteem it among the eternal works of nature." Quid autem miracum cometas, tam rarum mundi spectaculum, nonum tamur legibus certis, ne initia illorum hanc obsevisisse, quorum ex ingentibus us intervallum recurritur eff? Veniti tempus quo sita quae nunc latint; in lucem dies erubuit, & longiora evit diligentia. Veniet tempus quo posibi nifi veliam tam opera nusse sove mieruntur. Lati qui demofreti, si quando, in quaibus comites paribus erunt; cur tam defeunt calvis erunt. quanti quaevis fact.

This prediction we have so admirably accomplished in our days by the great sir Isaac Newton; whole doctrine concerning them will appear in the sequel of this article. Saccre recommended it to astronomers to keep a catalogue of the comets, in order to be able to determine whether they returned at certain periods. The authority of Aristotle, however, long prevailed; and comets were generally considered as meteors, existing in our atmosphere, till the time of Tycho Brahe. This excellent astronomer was the first among the moderns, who, after diligently observing the comet of 1577, and finding that it had no sensible diurnal parallax, ascribed to its true place in the planetary regions. (See his book De Cometa, anno 1577.)

Although few comets have approached to near the earth as to have a diurnal parallax, they afford sufficient indications of an annual parallax; that is, the revolution of the earth in her orbit causes their apparent motion to be very different from
from what it would be, if they were viewed from the sun, or any fixed place. See the first of the phenomena recited in the figure. This shows that they are not to distant as the fixed stars, which have no annual parallax; and, as Huygens observes, affords a proof of the earth's revolution round the sun; for, without supposing that, these motions of comets are inexplicable. Tychos was preceded by Kepler, who, in his book "De Cometis," concluded from observations of the comets which appeared in 1607 and 1618, that comets move freely through the plane of the equator, and that the most remote of such different comets were to be revolved in nearly an elliptical orbit; but of what kind he could not precisely determine. He was followed by Huygens, an accurate observer of the heavenly bodies, who, found, by his own observations of two comets that appeared in his time, that they were not subject to diurnal parallax; that calculations of their places, made upon a supposition that they moved in straight lines, did not agree with their true places; but that their orbits were concave towards the sun; and concluded, that they moved in parabolic trajectories.

Hevelius, from a great number of observations, proves it as his opinion, that the comets, like the solar prominences or spurs, are formed and condensed out of the greater exhalations of his body; or that they are generally in the atmosphere of a planet, and discharged from it, partly by the rotation of the planet, and then revolved about the sun in a parabola by the force of projection and its tendency towards the sun, in the same manner as a projectile upon the earth's surface describes a parabola. In which notion he agrees nearly with Kepler, who maintains, that comets are generated in the mother in vast numbers, like flocks in the ocean; though they do not all become visible; either because of their smallness, or because they lie a long time under the horizon.

But Sir Isaac Newton has shown the fallacy of this hypothesis, by proving that the comet of 1680, in its passage through the neighbourhood of the sun, would have been dissipated, had it consisted of exhalations of the sun and planets; for the heat of the sun, it is allowed, is as the density of his rays, i.e. reciprocally as the squares of the distances of places from the sun. Wherefore, since the distance of that comet in its perihelion, December the 5th, was observed to be to the distance of the earth from the sun, nearly as 6 to 1000; the sun's heat in the comet at that time, was to his heat with us at midsummer, as 10000:36, or 28000 to 1.

And again, finding by experiment, that the heat of boiling water is little more than three times the heat of one dry earth, when exposed to the midsummer's sun; and assuming the heat of red hot iron to be about three or four times as great as that of boiling water, he thence concludes, that the heat of the dried earth, or body of the comet in its perihelion, must be near 2000 times as great as that of red hot iron.

Such an immense heat once acquired in its perihelion, the comet must be a long time in cooling again. The same author computes, that a globe of red hot iron, of the dimensions of our earth, would scarce be cool in 50000 years. It then the comet be supposed to cool 100 times as fast as red hot iron; yet since its heat was 2000 times greater, supposing it of the bigness of the earth, it would not be cool in a million of years.

James Bernoulli, in his "Systema Cometarum," supposes some primary planet revolving round the sun in the space of four years and one hundred and fifty-seven days; and at the distance, from his body, of 258; semidiameters of the magnus orbis; this planet he concludes, either from its vast distance, or smallness, to be invisible to us: but, however, to have, at various distances from him, several satellites moving round him, and sometimes descending as low as the orbit of Saturn; and that these becoming visible to us, when in their perigee, are what we call comets.

Descartes advances another opinion: he conjectures that comets are only stars, formerly fixed like the rest, in the heavens; but which becoming by degrees covered with maculae, or spots, and at length wholly robbed of their light, cannot keep their place, but are carried off by the vortices of the circum-solar storms; and, in proportion to their magnitude and solidity, moved in such manner as to be brought nearer the orb of Saturn; and thus coming within reach of the sun's light, rendered visible.

But the vanity of all these hypotheses abundantly appears from the phenomena of comets; the chief of which we shall enumerate; as being the tell by which all theories are to be tried.

First, then, those comets which move according to the order of the signs, do all, a little before they disappear, either advance slower than usual, or else go retrograde, if the earth be between them and the sun; and more swiftly, if the earth be situated in a contrary part. On the other hand, those which proceed contrary to the order of the signs, proceed more swiftly than usual, if the earth be between them and the sun; and more slowly, or go retrograde, when the earth is in a contrary part.

2. So long as their velocity is increased, they move, nearly in great circles; but towards the end of their course, they deviate from these circles; and as often as the earth proceeds one way, they go the contrary way.

3. They move in ellipses, having one of their foci in the centre of the sun; and by radii drawn to the sun, describe areas proportional to the times.

4. The light of their bodies, or nuclei, increases in their receds from the earth towards the sun; and on the contrary, decreases in their receds from the sun.

5. Their tails appear the largest and brightest, immediately after their transit through the region of the sun, or after their perihelion.

6. The tails always decline from a full opposition to the sun towards those parts which the bodies, or nuclei, pass over, in their progress through their orbits.

7. This declination, ceteris paribus, is the smallest, when the heads, or nuclei, approach nearest the sun: and is least, if the nucleus of the comet, is towards the extremity of the tail.

8. The tails are somewhat brighter, and more distinctly defined in their course than in their recede part.

9. The tails always appear broader at their upper extreme than near the centre of the comet.

10. The tails are always transparent, and the smallest flares appear through them.

These are the chief phenomena of comets; which it is evident, cannot safely be reconciled with the wild notions of the ancients, and the weak conjectures of many of the moderns.

"The comets," says Sir Isaac Newton, "are composed, solid, fixed, and durable bodies: in one word, a kind of planets; which move in very oblique orbits, every way with the greatest freedom; perpetuating in their motions, even against the course and direction of the planets; and their tail is a very thin slender vapour, emitted by the head or nucleus of the comet, ignited or heated by the sun."
This at once solves all the foregoing phenomena: for, 1. It is evident, that those which proceed according to the order of the Signs, a little before they disappear, must move more slowly, or appear retrograde, if the earth be betwixt them and the sun; and swifter if the earth be in a contrary part. On the contrary, those proceeding against the order of the Signs, &c. For since this course is not among the fixed stars, but among the planets; as the motion of the earth either conspires with them, or goes against them; their appearance, with regard to the earth, must be changed; and, like the planets, they must sometimes appear swifter, sometimes slower, and sometimes retrograde.

2. "When the comets move the swiftest, they must proceed in straight lines; but in the end of their course, decline," &c. Because, in the end of their course, when they recede almost directly from the sun, that part of the apparent motion which arises from the parallax, must bear a greater proportion to the whole apparent motion.

3. "The comets must move in ellipses, having one of their foci in the centre of the sun." For otherwise they would not wander precariously from one fictitious vortex to another; but, making a part of a polar systeim, return perpetually, and run a constant round.

Hence, their elliptic orbits being very long and eccentric, they become invisible, when in that part most remote from the sun.

From considering the curvity of the paths of comets, Sir Isaac concludes, that when they disappear, they are much beyond the orb of Jupiter; and that in their perihelion they frequently descend below the orbit of Mars, and the inferior planets.

4. "The light of their nuclei must increase in their recedes from the sun, and vice ver.§." Because as they are in the regions of the planets, their accretes toward the sun bears a considerable proportion to their whole distance.

From observations of the comet of 1680, Sir Isaac Newton found, that the vapour in the extremity of the tail. January 23d, began to ascend from the head before December 1st, and therefore upon more than 20 days in its ascent; but the tail, which appeared December 10th, ascended in the space of those two days, then pulsated five times its period. The vapour, therefore, at the beginning, when the comet was near the sun, ascended with a prodigious swiftness; and afterwards continued to ascend with a motion retarded by the gravity of its particles; and by that ascent increased the length of the tail; but the tail, notwithstanding its length, continued almost wholly of vapours, which had ascended from the time of its period; and the vapour which ascended first, and composed the extreme of the tail, did not vanish till it was too far from the sun to be illuminated by it, and from us to be visible. Hence also, the tails of comets that are shorter, do not ascend with a quick and continual motion from the head, and then presently disappear; but are permanent columns of vapours and exhalations, gathered from the head, by a very gentle motion, and a great space of time; which yet, by participating of that motion of their heads they had at the beginning, continue easily to move along with their heads through the celestial regions; whence also the vacancy of those regions is argued. — See Vacuum.

5. "Their tails must appear the largest and brightest immediately after their transit through the region of the sun." Because, then, their heads being most heated, will emit the most vapours.

From the light of the nucleus, or apparent star, we infer their vicinity to the earth, and that they are by no means in the region of the fixed stars, as some have imagined; since, in that case, their heads would be no more illuminated by the sun, than the planets are by the fixed stars.

6. "The tails must still decline from a distinct opposition to the sun, towards the parts which the heads pass over, in their progress through their orbits." Because all smoke, or vapour, emitted from a body in motion, tends upwards obliquely, still receding from that part, towards which the smoking body proceeds.

7. "That declination will be still the nearest to the nucleus of the comet; and when the comet is nearest the sun." Because the vapour ascends more swiftly near the head of the comet, than in the higher extremity of its tail; and when the comet is at a less distance from the sun than when at a greater.

8. "The tail is brighter, and better defined in its convex part than in its concave." Because the vapour in the convex part, which goes first, being somewhat nearer and less swifter, will be more rarefied, and therefore made of the light more copiously.

9. "The tail will appear broader towards the higher extremity of the comet than towards the head." Because the vapour in a free space is perpetually rarefied and diluted.

10. "The tails must be transparent." Because consisting of infinitely thin vapour, &c.

Thus accurately does the hypothesis tally to the phenomena.

Comets, phaenomena. — The nuclei, which we also occasionally call the heads and bodies of comets, viewed through a telescope, shew a very different face from those of the fixed stars, or planets. They are liable to apparent changes, which Sir Isaac Newton ascribes to changes in the atmosphere of comets; and this opinion was confirmed by observations of the comet in 1744. Hilt. Acad. Scien. 1744. Sturmius tells us, that, observing the comet of 1680, with a telescope, it appeared like a coal dimly glowing, or a rude mass of matter illuminated with a dusky yellow light, its visible at the extremes than in the middle, rather thin than a flat, which appears with a round disk, and a vivid light.

Hevelius observed of the comet of 1661, that its body was of a yellowish colour, very bright, and conspicuous, but without any glittering light; in this middle was a dense ruddy nucleus, almost equal to Jupiter, encompassed with a much fatter, thinner matter. February 5th, its head was somewhat bigger and brighter, of a gold colour; but its light more dusky than the tail of the stars: here, the nucleus appeared divided into several parts. February 6th, the disk was lessened; the nucleus still existed, though less than before; one of them, on the lower part of the disk, on the left, much denser and brighter than the rest, its body round, and representing a very lucid little star: the nucleus still encompassed with another kind of matter. February 10th, the head somewhat more obscure, and the nucleus more confused, but brighter at top than bottom. February 13th, the head diminished much, both in magnitude and brightness. March 2d, its roundness a little impaired, its edges lacertated, &c. March 28th, very pale and exceeding thin: its matter much diffused; and no distinct nucleus at all appearing.

Weigelius, who saw the comet of 1664, the moon and a little cloud illuminated by the sun at the same time, observed, that the moon, through a telescope, appeared of a continued luminous surface; but the comet very different; being perfectly like a little cloud in the horizon illuminated by the sun.
fun. From these observations it was, that Hevelius concluded comets to be like macules, or spots formed out of the solar exhalations.

Comets, magnitude of. The estimates that have been given by Tycho, Hevelius, and some others, of the magnitude of comets, are not sufficiently accurate to be depended upon; for it does not appear, that they distinguished between the nucleus and the surrounding atmosphere. Thus Tycho computes that the true diameter of the comet in 1577, was in proportion to the diameter of the earth as 3 is to 14. Hevelius made the diameter of the nucleus of the comet of 1661 and also that of 1665 at the commencement of their appearances to be less than a 10th part of the diameter of the earth, and from the parallax and apparent magnitude of the head of the comet of 1652 on the 10th of December, he computed its distance to be that of the earth, as 52 to 100. By the same method he found the true diameter of the head of the comet of 1664 to be at one time 12 semi-diameters of the earth, at another time not much above 5 semi-diameters. The diameter of the atmosphere is often ten or fifteen times as great as that of the nucleus; the former, in the comet of 1682, was measured by Flamsteed, and found to be 2', but the diameter of the nucleus only 11 or 12'. Some comets, from the apparent magnitude and distance compared, have been judged to be much larger than the moon, and even equal to some of the primary planets. The diameter of that of 1744, when at the distance of the fun from us, measured about 1', and therefore its diameter must be about three times the diameter of the earth; at another time the diameter of its nucleus was nearly equal to that of Jupiter.

Hence it has been conjectured that some of the solar eclipses, recorded in history, that cannot be explained by calculation from tables of the fun and moon, have been occasioned by the interposition of comets between the fun and the earth. The eclipses of the fun mentioned by Herodotus (4. vii. c. 37, and 4. ix. c. 10.) have been thus accounted for, and also the eclipse that happened a few days before the death of Augustus, mentioned by Dion: and it is observable, that Seneca saw a comet the same year. History records some comets that have appeared as large as the fun, (vid. Seneca, N. Q. 1. 7. c. 15.) and, therefore, if such a comet near its perigee were to come between the fun and our earth, it would eclipse him for a time. Some have thought that the darkness which occurred at our Lord's crucifixion might have been occasioned by a comet then passing between the fun and the earth. (Hevel. Cometogr. p. 542. Forroi, relations sur un ancien phenomenon celeste au temps d'Olympe, Mem. de l'Acad. de Literature, vol. xix. p. 357.)

Dr. Herchel observed several comets which seemed to him to have no nucleus. The six comets discovered by his father were of this kind, and appeared to be mere collections of vapours condensed about a centre. Five more were observed by him, which were nearly of the same nature. This circumstance, he says, is "throws a mystery over their definition, which seems to place them in the allegorical view of tools, probably designed for some salutary purposes to be wrought by them; and, whether the restoration of what is lost to the fun by the emission of light may not be one of these purposes, I shall not presume to determine. The motion of the comet d'evolized by M. Meffier, June, 1770, plainly indicated how much its orbit was liable to be changed by the perturbation of the planets, which, and the little agreement that can be found between the elements of the orbits of all the comets that have been observed, it appears clearly that they may be directed to carry their salutary influence to any part of the heavens." Vol. IX.

Comets, Formation of the tails of. Sir Isaac Newton shews, that the atmosphere of comets will furnish vapour sufficient to form their tails: this he argues from that wonderful rarefaction observed in our air, at a distance from the earth; a cubic inch of common air, at the distance of half the earth's diameter, or four thousand miles, would necessarily expand itself so far as to fill a space larger than the whole region of the planets. Since then the comar or atmosphere of a comet, is ten times higher than the surface of the nucleus, counting from the centre thereof; the tail, ascending, much higher, must necessarily be immensely rare: to that it is no wonder the flares should be visible through it.

Now, the ascent of vapours into the tail of the comet, be supposed occasioned by the rarefaction of the matter of the atmosphere at the time of the perihelion. Smoke, it is observed, ascends the chimney by the impulse of the air wherein it floats; and air, rarefied by heat, ascends by diminution of its specific gravity, taking up the smoke along with it: why then should not the tail of a comet be supposed to be raised after the same manner by the fun? for the fun beams do not act on the mediums they pass through any other wise than by reflection and rarefaction.

The reflecting particles, then, being warmed by the action, will again warm the ether wherewith they are compounded; and this, rarefied by the heat, will have its specific gravity, whereby it before tended to descend, diminished by the rarefaction, so as to ascend, and carry along with it those reflecting particles, whereof the tail of the comet is composed.

This ascent of the vapours will be promoted by their circular motion round the fun; by means whereof, they will endeavour to recede from the fun, while the fun's atmosphere, and the other matters in the celestial spaces, are either at rest, or nearly so; having no motion but what they receive from the fun's circumrotation.

Thus are the vapours raised into the tails of comets in the neighbouring of the fun, where the orbits are molten curve; and where the comets, being within the denser atmosphere of the fun, have their tails of the greatest length.

The tails thus produced, by preferring that motion, and at the same time gravitating towards the fun, will move round his body in ciphers, in like manner as their heads; and, by this means, will ever accompany, and freely adhere to their heads. In effect, the gravitation of the vapours towards the fun will no more occasion the tails of the comets to forsake their heads, and fall down towards the fun, than the gravitation of their heads will occasion them to fall off from their tails: but by their common gravitation, they will either fall down together to the fun, or be together suspended, or retarded. This gravitation, therefore, does not at all hinder, but that the heads and tails of comets may receive and retain any portion towards each other, which either the above mentioned curve, or any other, may occasion. The tails, therefore, thus produced in the perihelion of comets, will go off along with their heads into remote regions; and either return thence, together with the comets, after a long series of years; or rather, be there load, and wait by little and little, and the comets be left bare; till at their return, descending towards the fun, some little short tails are gradually and slowly produced from the heads; which, afterwards, in the perihelion, descending down into the fun's atmosphere, will be immensely increased.

The vapours, when they are thus diluted, rarefied and diffused
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diffused through all the celestial regions, the same author observes, may probably, be little and little, by means of their own gravity, be attracted down to the planets, and become intermingled with their atmospheres.

He adds, that for the conservation of the water, and moisture of the planets, comets seem absolutely requisite; for in whole condensed vapoours and exhalations, all that moisture which is spent in evaporation and putrefactions, and turned into dry earth, &c. may be refublimed and recreated. For all vegetable grow and increase wholly from fluids; and, again, as to their greatest part, turn, by putrefaction, into earth again; and earthly fire being perpetually precipitated to the bottom of putrifying liquors. Hence, the quantity of dry earth must continually increase, and the moisture of the globe decrease, and at last quite evaporated, if it has not a continual supply from some part or other of the universe. And I suspect, adds our great author, that the spirit, which makes the finest, sublimate, and the best part of our air, and which is absolutely requisite for the life and being of all things, comes principally from the comets. So far are they from pertaining any hurt or mischief to us which the natural fars of men are apt to conjecture from the appearance of any thing that is uncommon and astonishing.

On this principle, there seems to be some foundation for the popular opinion of prelages from comets; since the tail of a comet thus intermingled with our atmosphere, may produce changes very sensible in animal and vegetable bodies.

But the transmutation of water into earth is now justly exploded. Woodward, Borelave, and others, having observed that water is only an agent in conveying the nutritions matter to vegetable bodies, and not that matter itself.

Another use which Sir Isaac Newton conjectures comets may be designed to serve, is that of recruiting the fun with fresh fuel, and repairing the consumption of his light by the comets continually sent forth in every direction from that luminary. In support of this conjecture he observes, that comets in their perihelion may suffer a diminution of their projectile force, by the resistance of the far atmosphere; so that by degrees their gravitation towards the sun may be so far increas’d, as to precipitate their fall into his body. Thus alfo, fixed stars which have been gradually wasted, may be replenish’d with fresh fuel, acquire new splendour, and be taken for new stars; of this kind are those fixed stars, which appear as a body, or flame with a surprising brightness at night, and afterwards vanish by degrees.

There have been various conjectures of the generation of the tails of comets. Apian, Cardan, Tycho Brahe, and some others, apprehended that they were produced by the sun’s rays transmitted through the nucleus of the comet, which they supposed to be transparent, and there refracted as in a lens of glass, so as to form a beam of light behind the comet. But this cannot be the case, because the figure of a comet’s tail does not correspond to such a refraction, and also because such refracted light would not be seen by an eye placed sideways to it, unless it fell upon some reflecting substance denser than the surrounding ether. Kepler supposed, that the rays of the sun carry away some of the gross parts of the comet which reflect the sun’s rays, and give the appearance of a tail. Hebus thought, that the thinnest parts of the atmosphere of a comet are raked by the force of the heat, and driven from the fore-part and each side of the comet towards the parts turned from the sun. des Cartes accounted for the phenomenon of the tail by the refraction of light from the head of the comet to the eye of the spectator. If this were the case, the planets and principal fixed stars must have tails also; for their rays pass through the same medium before they reach our eyes, as light from the comets does. Maarian supposes that the tails are formed out of the luminous matter that composes the sun’s atmosphere, which is supposed to extend as far as the orbit of the earth, and to furnish matter for those northern lights called the Aurora borealis, which see. M. de la Lande combines this hypothesis with that of Newton above recited. He thinks, that part of the vapour which forms itself is out of the atmosphere raked by heat, and is pushed forward by the force of the light streaming from the sun, and also that a comet passing through the sun’s atmosphere is devolved therein, and carries away some of it. Mr. Rowning, who is not satisfied with Sir Isaac’s opinion, accounts for the tails of comets in the following manner. It is well known, says he, that when the light of the sun passes through the atmosphere of any body, as the earth, that which passes on one side, is by the refraction thereof made to converge toward that which passes on the opposite side; and the convergence is not wholly effected either at the entrance of the light into the atmosphere, or at its going out; but beginning at its entrance, it increases in every point of its progress. It is also agreed that the atmospheres of the comets are very large and dense. He therefore supposes that by such time as the light of the fun has passed through a considerable part of the atmosphere of a comet, the rays thereof are so far refracted toward each other, that they would begin sensibly to illuminate it, or rather that the vapours floating therein, and so render that part they have yet to pass through visible to us; and that this portion of the atmosphere of a comet, thus illuminated, appears to us in form of a beam of the sun’s light, and passes under the denomination of a comet’s tail. Rowning’s Natural Philosophy, part iv. chap. 11.

We have an inquiry into the cause of the tails of comets, by Mr. Euler, in the Mem. de l’Acad. de Berlin, tom. ii. p. 177, seq. He thinks there is a great affinity between these tails, the zodiacal light, and the Aurora borealis; and that the common cause of them all, is the action of the fun’s light on the atmosphere of the comets, of the sun, and of the earth. He supposes that the impulse of the rays of light on the atmosphere of comets, may drive some of the finer particles of that atmosphere far beyond its limits; and that this force of impulse combined with that of gravity towards the comet, would produce a tail, which would always be in opposition to the sun, if the comet did not move. But the motion of the comet in its orbit, and about an axis, must vary the position and figure of the tail, giving it a curvature, and deviation from a line drawn from the centre of the fun to that of the comet; and that this deviation will be greater, as the orbit of the comet has the greater curvature, and that the motion of the comet is more rapid. It may even happen, that the velocity of the comet, in its perihelion, may be so great, that the force of the sun’s rays may produce a new tail, before the old one can follow; in which case the comet might have two or more tails. The possibility of this is confirmed by the comet of 1744, which was observed to have several tails while it was in its perihelion. See Aurora borealis, and Zodiacal light.

Dr. Hamilton urges several objections against the Newtonian hypothesis; obferving, that we have no proof of the existence of a solar atmosphere; that if we had, that when the comet is moving in its perihelion, in a direction at right angles to the direction of its tail, the vapours which then arise, partaking of the great velocity of the comet, and being also specifically lighter than the medium in which they move,
mufl suffcr a much greater refinement than the dense body of the comet does, and therefore ought to be left behind, and would not appear opposite to the fun; and afterwards they ought to appear towards the fun. Besides, if the fpecular of the tails be owing to the reflection and refraction of the fun's rays, it ought to diminifh the latitude of the fars seen through it; which would have their light reflected and refracted in like manner; and consequently their brightness would be diminished. He concludes that the tail of a comet is formed of matter which has not the power of reflecting or reflecting the rays of light; but that it is a lucid or self-luminous substance; and from its similarity to the Aurora borealis, produced by the fame caufe, and a proper electrical phenomenon. Dr. Hamilton supports his opinion by the following arguments. A spectator, at a distance from the earth, would fee the Aurora borealis in the form of a tail opposite to the fun, as the tail of a comet lies. The Aurora borealis has no effe on the fars seen through it, nor has the tail of a comet. The atmosphere is known to abound with electric matter, and the appearance of the electric matter in vacuum resembles exactly that of the Aurora borealis, which, from its great altitude, may be confidered to be in as perfect a vacuum as we can make. The electric matter in vacuum fuffers the rays of light to pass through, without being affected by them. The tail of a comet does not expand itself sideways, nor does the electric matter. Hence, he fuppofes the tails of comets, the Aurora borealis, and the electric fluid to be the fame kind of matter. As a further confirmation of this opinion it may be added, that the comet in 1607 appeared to shoot out the end of its tail. Le P. Cyfat remarked the undulations of the tail of the comet in 1618. Hevelius obferved the fame in the tails of the comets in 1652 and 1661. M. Pingré obferved the fame appearance in the comet in 1716; and there are circumftances similar to the Aurora borealis. Dr. Hamilton conjectures, that the ufe of the comets may be to bring the electric matter, which continually escapes from the planets, back into the planetary regions. Threfe arguments very much corroborate this hypothesis; and if it be true, we may further add, that the tails are hollow; for if the electric fluid only proceed in its frift direction, and do not diverge sideways, the parts directly behind the comet will not be filled with it; and this thinness of the tails will account for the appearance of the fars through them. Dr. Halley fowed inclined to this hypothesis, when he faid, that the dreams of light in an Aurora borealis fo much recombined the long tails of comets, that at frift they might well be taken for fuch; and that this light seems to have a great affinity to that which the effufion of electric bodies emit in the dark. Phil. Tran. No. 347. Hamilton's Philosophical Effays, p. 91, &c.

Hevelius particularly informs us, that he obferved the comet of 1665 to call a shadow upon the tail, for in the middle of its length there appeared a dark line. Callini also obferved in the tail of the comet of 1680 a darknes in the middle of the tail; and the fame appearance was taken notice of by a curious obferver in the tail of the comet of 1744. The lengths of the tails of comets are various, and depend on a variety of circumftances. Longomontanus mentions a comet that in 1618, December the 10th, had a tail which appeared under an angle of 104°; that of 1680 appeared under an angle of 70°, according to Sir I. Newton, and very brilliant; the comet of 1744 had a tail, which at one time appeared to extend 16° from its body; and which, allowing the fun's parallax to be 10°, mufl have been above 23 millions of miles in length. The diameter of its nucleus was nearly equal to that of Jupiter. The tail of the comet of 1759 appeared, according to M. Pingré, under an angle of 50°; but the light was very faint. The length of a comet's tail may be thus found. Let S (Plate IV. Astronomy, fig. 23.) be the fun. E the earth, C the comet, C.L. the tail when directed from the fun; then, knowing the place of the comet, we know the angle C.L., E.C, and the angle C.E.L., the angle under which the tail appears; hence we find C.L., the length of the tail. If the tail deviate by any angle LCM, found from obervation, we shall then know the angle ECM, with C.E, and the angle C.E.M., to find CM.

M. Fatio has obferved that fome of the comets have their nodes fo very near the annual orbit of the earth; that if the earth fhould happen to be found in that part next the node, at the time of a comet's paffing by; as the apparent motion of the comet will be incredibly swift, fo its parallax will become very ftrifte; and the proportion thereof to that of the fun will be given: whence fuch tranfits of comets will afford the belft means of determining the diftance of the earth and fun.

The comet of 1472, v. 97, had a parallax above twenty times greater than the fun's; and if that of 1618 had change. In the beginning of March to its defending ufed, it would have been more near the earth, and its aparallax much more notable. But hitherto, none has threatened the earth with a nearer appulfion than that of 1680: for, by calculation, Dr. Halley finds that November 11th, 1 h. 6 min. P.M. that comet was not above one femidiameter of the earth, to the northward of the way of the earth; at which time had the earth been in that part of its orbit, the comet would have had a parallax equal to that of the moon: what might have been the confequence of fo near an appulfion, a contact, or, laftly, a fchock of the cedal bodies?

If the earth had been at this time in that part of her orbit nearest to that node of the comet, through which it paffed, their mutual gravitation must have caufed a change in the plane of the orbit of the earth, and in the length of our year. Dr. Halley adds, that if fo large a body, with fo rapid a motion as that of this comet near its perihelion, were to flike against our earth, a thing by no means imprifible, the shock might reduce this beautiful frame to its original form, and from Flamit's measure of the apparent diameter of this comet, concluded its nucleus to be about ten times as big as the moon, or equal to a fourth part of our earth, attributes the univerfal deluge, in the time of Noah, to its near approach. His opinion was, that the earth paffing through the atmosphere of the comet, attracted from it a confiderable part of the waters of the flood; that the proximity of the comet raised a great tide in the subterraneous waters, fo that the outward cufm of the earth was not changed from spherical to ovall; that this could not be done without making fifures and cracks in it; that through these fifures the subterraneous waters were forced, in confequence of the change of the folve of the earth into a flat, capacious form; that, along with the water thus fqueezed up upon the surface of the earth, much flame or mud would rile; which, together with the grofler parts of the comet's atmosphere, would, after the subfiding of the water partly into the fifures and partly into the lower parts of the earth to form the fea, cover all over to a confiderable depth the antediluvian earth—and thus he accounts for trees and bones of animals being found at very great depths in the earth. He alfo fuppoled, that before the fall of the earth revolved round the fun in the plane of the eclipse, keeping always the fame points of its surface towards the fame fixed fars; by this means, as every meridian would come to the fun but once in a whole revolution, a day and a year were then the fame: but that a comet striking obliquely upon the
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earth gave it the diurnal rotation. Moreover, he apprehended, that the antediluvian year consisted of 360 days; but that the additional matter deposited upon the earth from the atmosphere of the comet at the time of the deluge, so retarded its revolution round the sun, that it is not now performed in less than 365 days and about a quarter.

The same comet, he imagined, would probably, by coming near the earth after being heated to an immense degree in its perihelion, be the instrumen tal cause of that great catastrophe, the general confusion, foretold in the Sacred Writings, and from ancient tradition, mentioned by heathen writers. See CONFLAGRATION, DELUGE, and Theory of the Earth.

COMETS, Method of. The analogy between the periodic time of the planets, and their distances from the sun, discovered by Kepler, takes place also to the comets. Hence, the mean distance of a comet from the sun may be found by comparing its period with the time of the earth's revolution round the sun: thus, the period of the comet that appeared in 1531, 1607, 1681, and 1750, being about 76 years, its mean distance is found by this proportion; as 1 to the square of one year, the earth's periodical time; so is 5770 to the square of 76, the comet's periodical time, so is 1000000 to the cube of 100, the earth's mean distance from the sun, to 5776000000 the cube of the comet's mean distance; the cube root of which is 1794, the mean distance itself, in such parts as the mean distance of the earth contains 100. If the perihelion distance of this comet 58 be taken from 3558 double the mean distance, we shall have the aphelion distance 3530 of such parts as the distance of the earth contains 100; and this is a little more than 35 times the distance of the earth from the sun. By a like method the aphelion distance of the comet of 1682 comes out 138 times the mean distance of the earth from the sun, supposing its period to be 577 years; so that this comet in its aphelion goes to more than 14 times the distance from the sun that Saturn does.

The limit of a comet's distance may be very easily ascertained from its tail, it being supposed to be directed from the sun. Let S (fig. 24.) be the sun, E the earth, E'T' the line in which the head of the comet appears, EW the line in which the extremity of the tail is observed, and draw ST parallel to EW; then the comet is within the distance ET; for if the comet were at T', the tail would be directed in a line parallel to EW, and therefore it could never appear in that line. T'EW is known by observation, and consequently its equal E'T'S, together with TES, the angular distance of the comet from the sun, and E'S, to find ST the limit. E.G. On December 21, 1680, the distance of the comet from the sun was 32° 24', and length of the tail 70°; hence ST : SE :: sin. 32° 24' : sin. 70° :: 4 : 7 nearly; consequently the comet's distance from the sun was less than 4 of the earth's distance from the sun. Hence Sir Isaac Newton deduced this comet to be more than all comets, whilst they are visible, are not farther distant from the sun than three times the earth's distance from the sun. This must, however, depend upon the goodness of the telescope, and magnitude of the comet. Vince's Altr. vol. i. p. 446.

Comets, motion of. If the paths of comets be supposed directly parabolic, as some have imagined, it would follow, that being impelled toward the sun by a centripetal force, they descend as from spaces infinitely distant; and by their falls acquire such a velocity, as that they may again run off into the remotest regions; and moving upwards, with such a perpetual tendency as never to return. But the frequency of their appearance, and their degree of velocity, which does not exceed what they might acquire by their gravity towards the sun, seem to put it past doubt that they move, planet-like, in elliptic orbits, though exceedingly eccentric; and so return again, though after very long periods.

The apparent velocity of the comet of 1772, as observed by Regiomontanus, was such as to carry it through 45° of a great circle in 24 hours; and that of 1770 was observed to move through more than 45° in the last 25 hours.

G. S. De révell, minifler at Pfizen in Upper Saxony, made observations upon the comet of 1650, and found that its motion might very well be represented by a parabola, which the sun in its focus; but not understanding the laws by which the motion of a body in a parabola is regulated, he erred considerably in his parabola, making the perihelion distance about 12 times greater than it was. This was published five years before the "Principia" of Newton, in which this illustrious author proved that Kepler's law, by which the planetary motions are regulated, was a necessary result of his theory of gravity; whence it immediately followed, that comets were governed by the same law, and the observations upon them agreed so accurately with his theory, as to leave no doubt of its truth.

Newton, Flamsteed, Halley, and the English astronomers, etc. seem satisfied of the return of the comets. Caffini, and others of the French, thought it highly probable; but de la Hire, and others, opposed it.

Those on the still more side suppose the comets to describe orbits prodigiously eccentric, incomprehensible that we can only see them in a very small part of their revolution; out of this, they are lost in the immense spaces; hid not only from our eyes, but from our telescopes. That little part of them, which reaches us, Newton has found to pass between the orbits of Venus and Mars.

For the reasons of the return of comets, M. Cassini gives these which follow. 1. In considering the course of the comets, with regard to the fixed stars, they are found to keep a considerable time in the arc of a great circle, i.e. a circle whose plane passes through the centre of the earth: indeed, they deviate a little from it, chiefly towards the end of their appearances; but this deviation is common to them with the planets.

2. Comets, as well as planets, appear to move so much the faster as they are nearer the earth; and when they are at equal distances from their perigee, their velocities are nearly the fame.

By subtracting from their motion the apparent inequality of velocity occasioned by their different distances from the earth, their equal motion might be found; but we should not be certain this motion were their true one, because they might have considerable inequalities, not discernible in that small part of their orbit visible to us. It is, in fact, quite the contrary; nournal motions, as well as those of the planets, is unequal in itself: and hence we have a reason why the observations made, during the appearance of a comet, cannot give the just period of their revolution.

3. There are no two different planets whose orbits cut the ecliptic in the same angle, whose nodes are in the same points of the ecliptic, and whose apparent velocity in their perigee is the same; consequently, two comets seen at different times, yet agreeing with all these three circumstances, can only be one and the same comet. And this were the comets of 1577 and 1680 observed to do; and those of 1652 and 1695; not that this exact agree-
agreement, in these circumstances, is absolutely necessary to determine them the same comet. M. Caffini finds the moon herself irregular in them all; accordingly, he is of opinion, there are several which disagree herein, and yet may be accounted the same.

The great objection against the return of comets, is, the rarity of their appearance, with regard to the number of revolutions affirmed to them. In 1701, there was a comet, or rather the tail of one, seen at Rome, which M. Caffini takes to be the same with that observed by Aristotle, and that since seen in 1668, which would imply its period to be thirty-four years. Now, it may seem strange, that a star which has so short a revolution, and of consequence such frequent returns, should be so seldom seen.—Again, in April, of the same year, 1702, a comet was observed by Maffi, Banchini, and Maraldi, supposed by the latter to be the same with that of 1693, both by reason of its motion, velocity, and direction. M. de la Hire took it to have some relation to another he had observed in 1678, which M. Caffini refers to that of 1652. On this supposition, its period appears to be forty-three months; and the number of revolutions between 1652 and 1703, fourteen: but it is hard to suppose, that in this age, wherein the heavens are so narrowly watched, a star should remain so long a time undiscovered; especially such a star as this, which might appear above a month together: and of consequence be frequently disengaged from the crenufula.

For this reason M. Caffini was very averse in maintaining the hypothesis of the return of comets, and only proposed those for planets, where the motions are easy and simple, and are resolved without standing, or allowing many irregularities.

M. de la Hire proposes one general difficulty against the whole system of the return of comets, which would seem to hinder any comet from being a planet: and it is this; that by the disposition necessarily given to their courses, they ought to appear as large at first as at last; and always increase, till they arrive at their greatest proximity to the earth: or, if they should chance not to be observed, as soon as they become visible, for want of attention thereto; at last it is impossible but they must frequently Flew themselves before they have arrived at their full magnitude and brightness. But he adds, that none were ever yet observed till they had arrived at it.

But the appearance of a comet in the month of October 1723, while at a great distance, so as to be too small and dim to be viewed without a telescope, may serve to remove this obstacle, and set the comets, still, on the same footing with the planets.

Sir Isaac Newton supposes, that as those planets which are nearest the sun, and revolve in the least orbits, are the smallest; so among the comets, such as in their perihelion come nearest the sun, are the smallest, and revolve in lesser orbits.

In order to prove that comets describe ellipses, and not parabolas or hyperbolas, Dr. Halley, in his "Synopsis of the Astronomy of Comets," advances the following reasons. "Hitherto I have considered the orbits of comets as exactly parabolic; upon which supposition it would follow, that comets being impelled towards the sun, by a centripetal force, would descend as from spaces infinitely distant; and, by their so falling acquire such a velocity, as that they may again fly off into the remotest parts of the universe, moving upwards with a perpetual tendency, so as never to return again to the sun. But since they appear frequently enough, and since none of them can be found to move with an hyperbolic motion, or a motion

†twice than what a comet might acquire by its gravity to the sun, it is highly probable they rather move in very eccentric elliptic orbits, and make their returns after long periods of time; for their number will be determinate, and perhaps not so very great. Besides, the space between the sun and the fixed stars is so immense, that there is room enough for a comet to revolve, though the period of its revolution be vastly long. Now the latus rectum of an ellipse is to the latus rectum of a parabola, which has the same distance in its perihelion, as the distance in the aphelion, in the ellipse, is to the whole axis of the ellipse. And the velocities are in a subduplicate ratio of the same; therefore, in very eccentric orbits, the ratio comes very near to a ratio of equality; and the very small difference which happens, on account of the greater velocity in the parabola, is easily compensated in determining the situation of the orbit. The principal use therefore of the table of the elements of their motions, and that indeed which induced me to construct it, is, that whenever a new comet shall appear, we may be able to know, by comparing together the elements, whether it be of any of those which has appeared before, and consequently to determine its period, and the axis of its orbit, and to foretell its return. And, indeed, there are many things which make it believe, that the comet which Apian observed in the year 1531, was the same with that which Kepler and Longomontanus more accurately described in the year 1607; and which I myself have seen return, and observed in the year 1682. All the elements agree, and nothing seems to contradict this my opinion, besides the inequality of the periodic revolutions; which inequality is not so great neither, as that it may not be owing to physical causes. For the motion of Saturn is so disturbed by the rest of the planets, especially Jupiter, that the periodic time of the planet is uncertain, for some whole days together. How much more therefore will a comet be subject to such like errors, which rises almost four times higher than Saturn, and whose velocity, though increased but a very little, would be sufficient to change its orbit, from an elliptic to a parabolical one. And I am the more confirmed in my opinion of its being the same; for, in the year 1356, in the summer-time, a comet was seen passing retrograde between the earth and the sun, much after the same manner, which, although nobody had observed such revolutions upon it, yet, from its period, and the manner of its transit, I cannot think different from those I have just now mentioned. And since looking over the histories of comets, I find, at an equal interval of time, a comet to have been seen about Easter, in the year 1356, which is another double period of 151 years before the former. Hence, I think, I may venture to foretell that it will return again in the year 1758." Dr. Halley computed, levi calano, as he himself informs us, the effect of Jupiter upon this comet in 1682, and found that it would increase its periodic time above a year, in consequence of which he predicted its return at the end of the year 1758, or the beginning of 1759. M. Clairaut computed the effects both of Saturn and Jupiter, and found that the former would retard its return in the last period 100 days, and the latter 511 days; and he determined the time when the comet would come to its perihelion to be in April 15, 1759, observing that he might err a month, from neglecting small quantities in the computation. It passed the perihelion on March 15, within 53 days of the time computed. Now if we suppose the time stated by Dr. Halley, to mean the time of its passing the perihelion, then if we add to that 100 days, arising from the action of Saturn which
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which he did not confide, it will bring it very near to the time in which it did pass the perihelion, and prove his computation of the effect of Jupiter to have been very accurate. If he meant the time when it would first appear, his prediction was very accurate, for it was first seen on December the 14th, 1758, and his computation of the effects of Jupiter will then be more accurate than could have been expected, considering that he made his calculations only by an indirect method, and in a manner professedly not very accurate. Dr. Halley, therefore, had the glory, first to forecast the return of a comet, and the event answered remarkably to his prediction. He further observed, that the action of Jupiter, in the deflection of the comet towards its perihelion in 1682, would tend to increase the inclination of its orbit; and accordingly the inclination in 1682 was found to be 22° greater than in 1677. From the observations of M. Meller upon a comet in 1770, M. Edric Proprina, member of the Royal Academies of Stockholm and Upsal, showed, that a parabolic orbit would not answer to its motions, and he recommended it to astronomers to seek for the elliptic orbit. This laborious task was undertaken by M. Lexell, who has shown that an ellipse, in which the periodic time is about 5 years and 7 months, agrees very well with the observations. (See Phil. Trans. for 1779.) As the ellipses which the comets describe are all very eccentric, astronomers, for the sake of calculation, suppose them to move in parabolic orbits for that part which lies within the reach of observation, by which they can very accurately find the place of the perihelion of a comet, its distance from the sun, the inclination of the plane of its orbit to the ecliptic, and the place of the node. But before we can determine the orbit of a comet, from observation, it will be necessary to premise such particulars respecting the motion of a body in a parabola, as may be requisite for such an investigation.

Accordingly let APM (fig. 25) be a parabola, S its focus, A the vertex, P the place of the body, draw PQ perpendicular to AS, and PD perpendicular to the tangent PT, also SM perpendicular to AD. Now, by the property of the parabola, QD is equal to the latus rectum; hence if AS = t, then QD = 2t; also the angle ASP = 2 PDA; therefore if QD be radius, PQ will be the tangent of PDA, or 2 PSA; hence to the radius AS, PQ will be twice the tangent of 2 PSA; therefore if 2t = PQ, t will be the tangent of (2t) half the true anomaly of PSA, to the radius AS = t. Also, by the property of the parabola, AQ = 4 ASQ; hence AQ = t; also the area AQP = 2t²; and as QS = t + t, the area QPS = t³; hence the area A SP = 2t² + t; also the area ASM = 4t. Now let a and b be the times in which the comet moves from A to M, and from A to P, then, as the areas described about S are proportional to the times, a : b :: 2 : 3 t² + t; therefore a t³ + 3 a t² = 4 b.

Hence if a and b, the true anomaly be given, we have the time b = 4 a t³ + 2 a t. Also, because a : b :: 4 : 3 t² + t, therefore if the true anomaly, and consequently b, be given in different parabolas, the times of describing those true anomalies from the perihelions will be in proportion to the times of describing 90° from the perihelions.

If the times a and b be given, the true anomaly may be found from resolving the cubic equation t³ + 3 t² = b, which may be done thus. In the right-angled triangle C A B, (fig. 26) let A B = b, A C = b, and compute BC; then and two mean proportionals between BC + A C and BC — A C, and their difference is the value of t.

Take the fluxion of t + 3 t² = b, and we have \( i = \frac{4}{3} \times \frac{b}{t³ + t} \), but \( i = t + t^2 \times t + 1; \) hence we get \( 2 \times \frac{b}{t³ + t} = \frac{4}{3} \).

\[ \frac{b}{t³ + t} = \frac{8}{3} \times \text{col. } t + t^2 \times t^3 \text{ the variation of the true anomaly corresponding to any small variation } \frac{b}{t³ + t} \text{ of time expressed in decimals of a day, } \frac{b}{t³ + t} \text{ being expressed in days.}

Let SA (fig. 25) be the mean distance of the earth from the sun; then the area of the circle, described with that radius, will be \( 3 \times 14159 \) also the area AM = 4. Now the velocity in the parabola: velocity in the circle: \( \sqrt{2} : \frac{1}{3} \), for let PP (fig. 27) be an indefinitely small arc described by the body, S the place of the fun, SN a line drawn from the focus, S, perpendicular to a tangent to the parabola A P D at the point P, then, \( \therefore \), The velocity u in any point P of the parabola, is as the square root of the parameter divided by SN: for, the velocity is as the arc PP or \( u = p \); now, \( p \) M be perpendicular to PS, in the similar right-angled triangles p P M, P S N, S N: \( S P \cdot p \cdot M = \frac{p \cdot M}{S N} \). But the parameter is as the square of the described sectors; therefore R (the parameter) = \( p \cdot M \cdot S P \), and \( \sqrt{R} = \frac{p \cdot M}{S N} \); and by substitution, \( p \) P or \( u = \sqrt{4 \cdot A S} \times S N \), or \( u = \sqrt{4 \cdot A S} \times S N \), from the nature of the parabola. 2dly, \( \therefore \), The velocity u in any point P of the parabola, is to the velocity V of a body running through the circumference of a circle with a central force tending to its centre, the radius being equal to SP, as \( \sqrt{\frac{1}{2}} : 1 \). For, since \( u = \sqrt{4 \cdot A S} \times S N \), \( u = \sqrt{4 \cdot A S} \times S N \); or, because \( S N^3 = S P \times S A \) (by the property of the Parabola), \( u = \sqrt{4 \cdot A S} \times S P \times S A = \frac{4 \cdot A S}{S P} \). But the circle whose radius is SP, being taken as an ellipse, its parameter is = \( 2 \cdot S P \); and the velocity V being uniform, it is everywhere as \( \frac{4 \cdot A S}{S P} \); therefore \( V = \frac{2 \cdot S P}{S P^3} = \frac{2 \cdot S P}{S P^3}; \therefore \) consequently \( u = \frac{4 \cdot A S}{S P} \); therefore \( V = \frac{2 \cdot S P}{S P^3}; \therefore \) for the time the time in the circle = \( 3 \times 14159 \) of \( 4 \cdot 365 \cdot 6 \). \( \therefore \), the time of describing A M = 1009d. 14h. 46m. 20s. Now as the time of describing AM is in a given ratio to the time in the circle, which varies as \( S A^3 \), therefore if \( r = \) the perihelion distance in any other parabola, we have \( r = \frac{15}{149} \); \( r = \frac{15}{149} \); \( \therefore \), the time of describing 90° in that parabola from the perihelion. Hence, knowing the time corresponding to any true anomaly in that parabola whose perihelion distance = 1, we know the time corresponding to the same true anomaly in any other parabola, because the times
times of describing 90° are as the times corresponding to the same true anomaly; therefore if \( n \) be the number of days corresponding to any given anomaly in that parabola whose perihelion distance is unity, then \( n r^{2} \) will be the time \( r \) corresponding to the true anomaly in that whose perihelion distance is \( r \). This may be readily found thus. Multiply the log. \( r \) by 3 and divide by 2, and to the quotient add the log. \( n \), and the sum will be the log of the time required.

Hence also \( n = \frac{r^{2}}{3} \); therefore if from the log. \( r \) we subtract \( \log \, r \), it gives the log. \( n \) of the number of days corresponding to the same anomaly in the parabola, whose perihelion distance is unity. This anomaly will be found from a table which exhibits the times corresponding to the true anomaly for 250000 days from the perihelion, in that parabola whose perihelion distance is unity. This table may be constructed by the preceding problem, by taking \( a = 109 \), 6154, and allowing \( b = 1, 2, 3, 4, \ldots \), and finding the corresponding values of \( t \).

Dr. Halley first constructed a table of this kind. M. de la Caille changed it into a more convenient form, by putting the areas for the times; Mr. Vincen has given that which was computed by M. de Lambre. (See Vincen's Alton. vol. i. p. 454, &c.)

Draw \( SY \) perpendicular to the tangent; then \( SP : SY = SA : \sqrt{SA} \), therefore \( \sqrt{SP} = \sqrt{SA} : \sqrt{SY} \); rad. \( : \) cos. \( PS \), or \( \frac{1}{2} \) PSA the true anomaly; or \( SP : SA = \cot. : \sqrt{SA} \), true anomaly. Hence, if \( SA = 1 \), and \( a + x = \frac{1}{2} \) PSA, \( a - x = \frac{1}{2} \) PS, then \( \sqrt{SP} = \cot. \cdot \sqrt{SA} : \sqrt{SP} = \cot. \cdot \cot. : \sqrt{SP} = \cot. : \tan. \cdot \cot. = \cot. \cdot \cot. = \cot. \).

Hence \( SP = \cot. \cdot \sqrt{SA} \), radius being unity; therefore from log. \( SA \) subtract twice the log. \( \cot. \), log. \( \frac{1}{2} \) true anomaly, and the remainder is the log. of the distance of the comet from the sun.

Erect \( BD \) (fig. 28) perpendicular to \( AB \), take \( BC = AB \), produce \( AC \) to \( E \), and draw \( DEF \) perpendicular to \( A E \), meeting \( AP \) parallel to \( BD \) in \( F \), join \( AD \), and draw \( DG \), \( CH \) parallel to \( AB \). Then, as \( EAF = 45° \), \( EA = EF \), and \( GFG = GD = AB \); hence \( AF = BD + BA \), and \( GH = BD - BA \); and for their similar triangles, \( AF \) or \( BD + BA \) : \( CD \) or \( GH \) = \( EF \) or \( BD - BA \) : \( ED \) or \( BA \). From \( \tan. \cdot \cot. \), and \( \cot. \cdot \cot. \) we have \( BD = \sqrt{SP}, \) and \( BA = \sqrt{SP} \), then \( \sqrt{SP} = \cot. \cdot \sqrt{SP} \).

The elements of the Orbit of a Comet, to compute the place at any time.

The elements of the orbit of a comet are: 1. The time when the comet passes the perihelion. — 2. The place of the perihelion. — 3. The distance of the perihelion from the sun. — 4. The place of the ascending node. — 5. The inclination of the orbit to the ecliptic. From these elements, the place at any time may be computed; and, for example, we shall take that given by M. de la Caille in his Astronomy. The place of the comet in 1739, which was retrograde, passed its perihelion on June 17th, at 1st. 9° 27' mean time; the place of the perihelion was in 3° 12° 38' 45"; the perihelion distance was 0.69738, the mean distance of the earth from the sun being unity; the ascending node was in 0° 27° 25° 14"; and the latitude of the orbit 55° 42' 44"; to compute the place from the earth on August 17th, at 14° 20' mean time.

Let \( W, AV \) (fig. 28) be the parabolic orbit of the comet, \( N \) the ascending node, \( P \) the place of the comet, \( T \) the corresponding place of the earth, and draw \( \mathfrak{p} \), \( \mathfrak{p}' \) perpendicular to the ecliptic; produce \( SN, S \mathfrak{w}, S \mathfrak{p}, S \mathfrak{p}' \) to \( n, n', \mathfrak{p}, \mathfrak{p}' \) the sphere of the fixed stars, and describe the great circles \( n \mathfrak{p}, n' \mathfrak{p}, \mathfrak{p} \mathfrak{p}' \). and \( \mathfrak{p} \).

I. The interval of time from the perihelion to the place of the comet in 616. 46. 10° 30', 61. 1741, whole log. is 1.86575; or, the log. of the 0.8785, is 4.826, of which log., from the nature of logarithms, is 9.74258, which subtracted from 1756567 leaves 4554985, the log. of 11685667 days, which, by the table, answers to 3° 21' 39" the true anomaly \( \mathfrak{p} \) of the comet at the given time.

II. Subtract 3° 21' 35" from 3° 12° 38' 45" the place of the perihelion, because the comet was retrograde, and had passed the perihelion, and it leaves 12° 17' 11" for the heliocentric place of the comet in its orbit.

III. The longitude of \( n \) is 27° 21° 14", also \( \mathfrak{p} = n = 27° 25° 14" = 12° 17' 11" = 15° 8' 13" \); hence radial: \( \cot. \cdot \mathfrak{p} = \cot. \cdot n = \frac{1}{2} \cdot 43' 44" \); tan. \( \mathfrak{p} = \cot. \cdot n = 15° 8' 13" \); tan. \( n = \frac{1}{2} \cdot 35° 53" \) the distance of the comet from the ascending node, measured upon the ecliptic.

IV. Subtract this value of \( \mathfrak{p} \) from the place of the node, and there remain 18° 45' 21" = \( \mathfrak{n} \) the true heliocentric place of the comet reduced to the ecliptic.

V. As rad.: \( \mathfrak{n} = 15° 8' 13" \); \( \mathfrak{n} = 55° 42' 44" \); \( \mathfrak{n} = 12° 25° 34' \) the latitude seen from the sun, which is north.

VI. The true place \( T \) of the earth at the same time is 10° 42° 34° 36°; hence \( T \mathfrak{S} = 33° - 5° 24" \); therefore \( T \mathfrak{S} = 14° 10' 45" \). Also \( T \mathfrak{S} = 10.0171 \).

VII. By
VII. By a preceding article, vol. 45° 10' 49". rad. 1: 9.6758: SP = 1:3557
VIII. Astr. vol. 1:227' 34". SP = 1:3557
S = 1: 12: 32: 37.
IX. In the triangle TS v, we know TS, S and the included angle TS v; hence, by plain trigonometry, we find the angle ST v = 77° 33' 38" 1, which subtracted from 4° 24° 34' 36", the place of the fun, leaves 2° 7' 9" 1 for the comet's true geocentric longitude.

X. Moreover, as fin. 54° 10' 47": sin. 77° 33' 38" 1: tan. P ST v = 1:227' 24": tan. P ST v = 1:227' 4": the comet's true geocentric latitude.

To determine the Orbit of a Comet from Observation.

Sir I. Newton first resolved this problem, which he called "Problema longe difficilissimum." The orbit of a comet may be computed from three observations: but although these data be sufficient, the direct solution of the problem is impracticable. Astronomers therefore have found it necessary to resort to indirect methods, first finding an orbit very near to the truth by mechanical and graphical operations, and then, by computation, correcting it, until such a parabola was found as would satisfy the observations. Mr. Vine therefore begins, by the method of which the orbit may be nearly determined; and then explains the manner in which it may be corrected by calculation.

M. de la Lande proposes the following mechanical method of finding the orbit nearly. Divide the distance of the earth from the sun into ten equal parts, and describe ten parabolas whose perihelion distances are, 1, 2, 3, &c., of these parts, and divide these parabolas into days from the perihelion, answering to the motion of a body in each. Let S (fig. 31.) be the fun. a, b, c, the places of the earth at the times of three observations of the comet. Then take three geocentric latitudes and longitudes of the comet, and set off the elongations S a, S b, S c, in longitude. From a, b, c, extend three fine threads a m, b n, c p, vertical to a s, b s, c s, making angles with them equal to the geocentric latitude of the comet. Then take any one of the parabolas, and placing its focus in S apply the edge to the threads, and observe whether you can make it touch them all, and whether the intervals of time cut off by the threads upon the parabola be equal to the respective intervals of the observations, or very nearly so; and if these circumstances take place, you have then got the true parabola, or very nearly the true one. But if the parabola do not agree, try others, till you find one which does agree, or very nearly so, and you will then have got very nearly the true parabola, whose inclination, place of the node, and perihelion, are to be determined as accurately as possible from mensuration; also the projection upon the ecliptic. If none of these parabolas should nearly answer, it shows, that the perihelion distance must be greater than the distance of the earth from the sun, in which case, other parabolas must be constructed; but this does not very often happen. This method will determine the elements very nearly; but it would be extremely troublesome to construct and divide for many parabolas, if we only wanted to compute the elements of one comet; for that purpose to make many computations of this kind, it must be worth while to have a set of parabolas thus divided. To avoid this trouble therefore, Mr. Vine proposes to do it in the following manner, by means of one parabola, without dividing it.

Take a firm board perfectly plane, and fix on paper for the projection; let a groove be cut near the edge, and five perpendiculars be movable in it, so that they may be fixed at any distances. Let S (fig. 32.) represent the sun, and describe any number of circles about it. Compute five geocentric latitudes and longitudes of the comet, from which you will have the five elongations of the comet at the times of the respective observations. Draw S a, S b, S c, S d, S e, making the angles A S B, B S C, C S D, D S E, equal to the sun's motion in the intervals of the observations; and on any one of the circles, make the angles S a S b, S b S c, S c S d, S d S e, equal to the respective elongations in longitude, and fix the five perpendiculars, so that the edge of each may coincide with a, b, c, d, e. From the points a, b, c, d, e, extend threads to the respective perpendiculars, making angles with the plane equal to the geocentric latitudes of the comet, then the focus of the parabola, in S, and apply the edge to the threads, and if it can be moved to touch them all, it will be the parabola required, corresponding to the mean distance S x of the earth, which we here suppose to revolve in a circle, as it will be sufficiently accurate for our purpose. If the parabola cannot be made to touch all the threads, change the points a, b, c, d, e, to such of the other circles as you may judge, from your present trial, will be most likely to succeed, and try again; and by a few repetitions you will get such a distance for the earth, that the parabola shall touch all the threads, in which position, and the inclination, observe the place of the node, and measure the perihelion distance, compared with the earth's distance, and you will get very nearly the elements of the orbit.

The next method of approximating to the orbit of a comet, which we shall explain, is that given by Boicovich. Let S (fig. 33.) be the sun, X the orbit of the earth, supposed to be a circle; T the place of the earth at the first observation, and t at the third; draw T C, t C to represent the observed longitudes of the comet, and let a, b, c, be the longitudes at the first, second, and third observations of the fun and n the geocentric latitudes of the comet at the first and third observations; and t, T, the intervals of time between the first and second, second and third observations. Assume C for the place of the comet, at the first observation, reduced to the ecliptic; then to determine the point at the third observation, say T x sin. a = T x sin. 7 = 1. = TC: tc, and e will be nearly the place required; (See B from "Opuscula," vol. iii. or for II. Engle- held's valuable work upon comets, p. 27.) Join C x, and it will represent the path of the comet on the ecliptic, upon this assumption. Perpendicular to the ecliptic draw C K, e, taking C K: T C = tan. m: radius, and e k: t c = tan. n: radius, join K k, and it will represent the orbit of the comet, if the first assumption be true. But C x e m, and draw x y parallel to C K, and y will befe k; join y S. Let S X = r; then if v be the mean velocity of the earth in its orbit, the velocity of the comet at y = \sqrt{x^2 + v^2} / \sqrt{y^2 + v^2}; taking therefore v = T t, compute \sqrt{x^2 + v^2} / \sqrt{y^2 + v^2}, and if this be equal to K k, measured by the scale, the assumed point C was the true point. But if these quantities be not equal, assume a new point for C, in doing which, the error of the first assumption will direct you which way, from the first assumed point, it must be taken, and about how far from it; if, for instance, the computed value of K k be greater than the true value, and the lines C K, e k, are diverging from each other, and receding from the sun, the point C must be taken further from T, and how much further we must conjecture from the value of the error, and also from hence, that the velocity of the comet diminishes as it recedes from the sun. These con-
Comet.

The solar system to vast distances beyond the orbits of the most distant planets return again to the neighborhood of the sun, the paths they describe must be nearly elliptical; and then, if observations have been made sufficiently exact to be a basis of the operations, the requisite of the problem may be determined in the following manner: Let \( A \) \( B \) \( D \) \( E \) be the trajectory of a comet, \( A \) its major axis, \( E \) the minor, \( S \), the two foci, the former of which being the place of the sun, \( C \) the place of the comet. \( S \) is its distance from the sun, \( C \) the space it passes over in a very small portion of time, \( D \) \( E \) a tangent to the curve in the point \( C \), \( S \) \( D \) \( F \) \( E \), perpendiculars demitted thereon from the focus: draw \( S G \) parallel to the tangent, and join \( F C \). Also, let \( A \) \( L \) \( B \) be a circle, described on the major axis \( A B \); \( A \) \( P \) \( T \) a rectangle about the ellipse \( A T \), and \( A \) \( Q \) \( R \) \( B \) a square about the circle \( A L B \). Lastly, let \( A \) \( N \) \( O \) be the elliptic orbit of any planet, \( S \), its focus; put \( S C = a \), \( S D = b \), \( C E = r \), the time in which it is described \( f \), the major axis of the cometary orbit \( A B = x \), of the planetary orbit \( A O = q \), the circumference of the circle \( A V O \) described on the same axis \( p \), the periodical time of the comet \( t \). and that of the planet \( = n \).

The space \( C c \) described, the distance \( S C \), and the angle \( S C D \), being all determinable by observation, are given quantities. The mean distance of the comet is \( A H = S K = \frac{x}{2} y \), and of the planet is \( A S = S N = \frac{n}{2} q \); and, because the squares of the periodical times are as the cubes of the mean distances, we have

\[
\left( \frac{1}{2} x^3 \right)^n = \left( \frac{1}{2} q^3 \right)^n \quad \text{or} \quad t = \frac{1}{2} \sqrt{\frac{x^3}{q^3}}.
\]

But it is necessary to find another expression for the periodical time \( t \), which may be done thus: because \( Cc \) is a very minute portion of the orbit, it may be esteemed a right line, and the factor \( C C \) \( S \) \( C \) as a rectilineal triangle, whole area

\[
\frac{1}{2} S D \times C c = \frac{1}{2} b e \text{ is given}; \text{then, as the area} \frac{1}{2} b e, \text{is to the whole area of the ellipse} A K D I = A, \text{ft is the time} \]

\[f \text{ to the whole periodical time} t; \text{wherefore} t = \frac{f}{b e} \times A.
\]

Now, in order to determine the area \( A \), we must find the semi-conjugate \( H K \); and here, because \( A B = S C + F C \), we have \( F C = x - a \); and by the similar triangles \( S D C \), \( F E C \), we have \( S C = \frac{S D \times F C}{F E} \); \( A \) \( S \) \( C \) \( D \) \( C \) \( F \) \( E \), which \( a \) \( b \) ::

\[
x - a = \frac{b x - 2 a b}{a} = F E; \text{consequently} \quad F G = F - G E = \frac{b x - 2 a b}{a}. \text{Again,} \quad S C = D C = F C = CE; \text{or} a :: \sqrt{a^2 - b^2} :: x - a \quad \text{hence} \quad D E \text{ or}
\]

\[
S G = CE + CD = \frac{x - a}{a} \sqrt{a^2 - b^2} + \sqrt{a^2 - b^2} - \frac{x}{a} \sqrt{a^2 - b^2}.
\]

But \( F G = b x - 2 a b \); therefore \( F S = \frac{\sqrt{a^2 - b^2} + x}{a} \sqrt{x} \sqrt{b x - 4 a b x + 4 a b^2 + a^2 x - b x^2} \)

\[
= \sqrt{\frac{b x^2 - 4 a b x + 4 a b^2 + a^2 x - b x^2}{a^2}}
\]

\[
= \sqrt{\frac{a^2 x^2 - 4 a b x + 4 a b^2 + a^2 x}{a^2}}; \text{and of course} \quad S H = a \sqrt{\frac{a^2 x^2 - 4 a b x + 4 a b^2 + a^2 x}{a^2}}.
\]

Moreover, since \( S K = A H = \frac{1}{2} x \), \( \Pi K \); \( \sqrt{S K^2 - S H^2} = \sqrt{\frac{4 a x - a^3 - 4 a b x + 4 a b^2 + a^2 x}{4 a^2}} \)

\[
= \frac{b}{a} \sqrt{a x - a^3}; \text{therefore} \quad K = 2 \frac{b}{a} R \sqrt{a x - a^3}.
\]
\[ \frac{\sqrt{a x} - \sqrt{a x}}{a} = \text{area of the rectangle} \]

A \text{ P T B}. \text{ Let } P \text{ be the periphery of the circle } A I B, \text{ whose diameter is } x, \text{ then its area will be } \frac{\pi}{4} \cdot x^2, \text{ and we shall have } x^2 = \frac{1}{\pi} \cdot x^2 P, \text{ and } A B = \frac{x}{\pi} P = A Q R B + A I B; \text{ that is } q^2 = \frac{1}{4} q^2 \]

\[ \frac{1}{a} \sqrt{\frac{a x - a^2}{a}} = A I B. \text{ But if} \]

\[ 2 A I B = A I K B = A = \frac{b}{q} \sqrt{a x - a^2}; \text{ therefore,}
\]

substituting this value of \( A \), in the preceding expression, we have \( t = \frac{b}{q} \sqrt{a x - a^2}. \) Equate this value of \( t \), with that already given, then \( \frac{n x}{q} \sqrt{\frac{x}{q}} = \frac{b x}{q} \sqrt{a x - a^2}; \) which equation reduced, gives \( x = \frac{a f^3 P^3 q}{f^2 P^2 q - \alpha e^2 n^2} = A B, \text{ the major axis of the comet's elliptical trajectory.}
\]

If we substitute this value of \( x \), in the above equation, for \( t \) we shall have \( t = \frac{f^3 P^3 a^3}{q^2 P^2 q - \alpha e a^3} = \frac{1}{2} \) the periodical time. Also, because the conjugate \( K = \frac{2 b}{q} \sqrt{a x - a^2} = t, \) we have \( x = \frac{a f^3 P^3 q}{f^2 P^2 q - \alpha e^2 n^2} \) whence by reduction, we find \( e = \frac{2 b \alpha n}{\sqrt{f^2 P^2 q - \alpha e^2 n^2}} \), the minor axis of the orbit.

From these equations, it obviously appears, that when the velocity of the comet is such that \( f^3 P^3 q = a \alpha e^2 n^2, \) the axis \( x \) will be infinite, and consequently the trajectory will be a parabola; if \( a e^2 n^2 \) be greater than \( f^3 P^3 q, \) the direction of the axis will be on the other side of the curve, which will be an hyperbola; in either of which cases, the comet can never return: but in every instance where \( f^3 P^3 q \) is greater than \( a e^2 n^2, \) the comet will describe an ellipse amongst these

we may comprize the circle, where \( x = 2 a \alpha = \frac{a f^3 P^3 q}{f^2 P^2 q - \alpha e^2 n^2} \) and \( f^3 P^3 q = 2 a e^2 n^2, \) whence \( e = \frac{f^3 P^3 q}{2 a} \sqrt{\frac{f^2 P^2 q - \alpha e^2 n^2}{f^2 P^2 q}} \), the arc of the circle described in one day, or one hour, according as the value of \( e \) is given in days, or hours.

Let the earth be the planet we supposed to describe the ellipsis A N O; then its mean distance was 10,000,000, or \( q = 200,000, \) and \( P = 365 \times 318 \) and the periodical time \( n = \frac{1}{2} \); then if \( C \) be the portion of the comet's orbit described in one day, we have \( f = \frac{1}{365 \times 318} = 0.000273 \).

The other expressions will become as follow: for the principal axis \( x = \frac{\frac{30^1}{318} 650,033 \times a}{\frac{30^1}{318} 63,9033 \times a} = \frac{a}{2.3} \), and for the periodical time
\[ t = \frac{\text{arc}}{\text{time}} \]

It is extremely difficult to determine, from computation, the elliptic orbit of a comet, to any degree of accuracy; for when the orbit is very eccentric, a very small error in the observation will change the computed orbit into a parabola or hyperbola. Now, from the thinness and inactivity of the atmosphere with which the comet is surrounded, it is impossible to determine, with any great precision, when either

the limb or centre of the comet passes the wire at the time of observation. And this uncertainty in the observations will subject the computed orbit to a great error. Hence it happened, that M. Brouwer determined the orbit of the comet in 1749 to be an hyperbola. M. Euler first determined the same for the comet in 1744; but having received more accurate observations, he found it to be an ellipse. The period of the comet in 1665 appears, from observation, to be 57.5 years, which M. Euler, by his computation, determined to be 1664 years. The only safe way to get the period of comets, is to compare the elements of all those which have been computed, and where you and they agree very well, you may conclude that they are elements of the same comet; it being so extremely improbable that the orbits of two different comets should have the same inclination, the same perihelion distance, and the places of the perihelion and node of the same. Thus, knowing the periodical time, we get the major axis of the ellipse; and the perihelion distance being known, the minor axis will be known. When the elements of the orbits agree, the comets may be the same, although the periodical times should vary a little; as that may arise from the attraction of the bodies in our system, and which may also alter all the other elements a little. We have already observed, that the comet which appeared in 1759, had its periodical time increased considerably by the attraction of Jupiter and Saturn. This comet was seen in 1661, 1687, and 1731, all the elements agreeing, except a little variation of the periodical time. Dr. Halley suspected the comet in 1650, to have been the same which appeared in 1606, 531, and 44 years before Christ, when Julius Cesar was murdered; and that its period was five hundred and seventy-five years. Mr. Dunton, however, in the Phil. Trans. vol. xlvii., has endeavoured to shew from a MS. in Pembroke Hall Library, that the comet of 1106 could not be the same with that of 1685. But M. de la Lande adopts the opinion of Dr. Halley. He also conjectured, in the first edition of his Synopsis, without repeating it in the second edition, that the comet observed by Apian in 1532, was the same as that observed by Hevelius in 1661; if so, it ought to have returned in 1798 or 1799, but it has never been observed. The interval between the passages of the comet by the perihelion in 1532 and 1661 is 128 years. 8 days, 1 hour, 29 minutes, (32 of the years being bissextile) which, added to the time of the perihelion in 1661, together with 11.7 days, to reduce it from the Julian to the Gregorian file, would now put it out of the time of the next perihelion, to be April 27th, 11270. In the year 1759, Mr. M. Mechain having collected all the observations in 1752, and calculated the orbit again, found it to be sensibly different from that determined by Dr. Halley, which renders it very doubtful whether this was the comet which appeared in 1661; and this doubt is increased, by its not appearing in 1790. The comet in 1770, whose periodical time M. Lexell computed to be five years and seven months, has not been observed since. There can be no doubt but that the path of this comet, for the time it was observed, belonged to an orbit whose periodical time was that found by M. Lexell. As the computations for such an orbit agreed to very well with the observations, but the revolution was probably longer before 1770: for as the comet passed very near to Jupiter in 1770, its periodical time might be sensibly increased by the action of that planet; and as it has not been observed since, we may conjecture, with M. Lexell, that having passed in 1772 again into the sphere of sensible attraction of Jupiter, a new disturbing force might probably take place and destroy the effect of the other. According to the above elements, the comet would be in conjunction with Jupiter on August.
COMET.

August 25, 1770, and its distance from Jupiter would be only \( \frac{2}{7} \) of its distance from the sun, consequently the sun's action would be only \( \frac{2}{7} \) times that of Jupiter. What a change must this make in the orbit! If the comet returned to its perihelion in March 1776, it would then not be visible. See M. Lexell's account in the Phil. Trans. 1779.

The elements of the orbits of the comets in 1645 and 1756 were so nearly the same, that it is very probable that it was the same comet; if so, it ought to appear again about the year 1848.

Mr. Cole, in his "Theory of Comets," advances an hypothesis, which, in some cases, may perhaps, be accurate. He supposes that the orbit of a comet is not an ellipse; but that, when it passes its perihelion, it has acquired so great a velocity, that its centripetal force is overcome by its centrifugal, and that consequently the comet continues to fly off in a parabola or hyperbola, till it come within the attraction of some fixed star; that this attraction may give it a new direction, and increase its velocity till it come to an aphelion below that star, when it may again fly off either in a parabola or hyperbola, and proceed till it fall into the attraction of another star, and thus visit many different systems.

Dr. Halley has given us a table of the astronomical elements of twenty-four comets, on the supposition that they moved in parabolas; though he thought it extremely probable that they really moved in very eccentric ellipses, and consequently returned after long periods of time. This table commences with the year 1337, and closes with 1678. By means of this table, and others similar to it, it may be determined whenever a new comet shall appear, by comparing it therewith, whether it be one of those which have already appeared, and consequently its period and the axis of its orbit be ascertained, and its return foretold. See his Synopsis of the Astronomy of Comets, annexed to Gregory's Astronomy. This was first published in the Philosophical Transactions in 1705, and republished with his Astronomical Tables in 1749. M. de la Caille changed this table into another of a more convenient form, by putting the areas for the times.

Another table has since been computed, from the observations contained in the Philosophical Transactions, De la Caille's Astronomy, and De la Lande's Histoire de la Comete de 1759, and Connaissance des Muevements Celestes 1762 & 1764. In this table are seen the elements of twenty-five other comets, from the year 1264 to 1762. The most extensive table for calculating the motions of comets, was computed by M. de Lambert; it is inserted, as we have already mentioned, in Mr. Vince's Astronomy, vol. i.

Another table on an extensive scale, computed by Mr. Lex, an ingenious friend of the editor, an excellent astronomer, and an attentive observer of the heavens, is annexed to this article.

The number of comets that are flated in the most accurate accounts to have appeared, since the commencement of our era, is about 500; and before that era, about 100 others are recorded to have been seen, though it is probable that not more than half of them were comets.

The elements of the comet of 1770, and the trajectory of its path, may be found in the Transactions of the American Philosophical Society, vol. i.

In Whiston's Solar System, the orbits of several comets are delineated, and the periods of as many of them as were then known, expressed.

COMET, To determine the place and course of a. For this purpose, it will be advisable to take the apparent diameter very frequently; and a judgment may thus be formed of its relative distance at different times; its degree of motion, its brightness, &c. must also be regarded; for when it moves with the greatest velocity, or appears most bright, we may infer that it is near its perihelion. If the place of the comet can be observed when it has no latitude, the place and time of its being in one of its nodes will then be exactly known; but as this can seldom be actually observed, these elements are generally obtained by approximation from other observations. In order to obtain the proper course of a comet, observe its distance from two fixed stars, whose longitudes and latitudes are known; or, find its altitude when in the same azimuth with any two known fixed stars; from the distance or altitude thus found, calculate the place of the comet by trigonometry, after the manner delivered under Planet, or in the preceding article. By repeating the observations and operations for several days successively, the course of the comet will be had.

COMET, To determine the course of a, mechanically, and without any apparatus of instruments. The following ingenious method, by a thread, we owe to Longomontanus: Observe four stars round the comet, such, as that the comet may be in the intersection of the right lines that join the two opposite stars; which is easily found by means of a thread placed before the eye, and extended over against the stars and comet.

Suppose, v, gr. the comet's place in the heavens A (Pl. IV. Astronomia, fig. 36.) between the four stars, B, C, D, E; where the line joining the stars B and D, passes through the body of the comet; and the like does the line passing through C and E.

On a globe, whereon these four stars are found, extend a thread through B and D, and another through C and E; the point of intersection will give the place of the comet. This practice being repeated for several days, the comet's course will be had on the globe; which course will be found to be a great circle; if this great circle, drawn through three distant places, and drawing its path among the stars, be continued till it intersects the ecliptic, it will shew nearly the place of the node, and the inclination of the orbit to the ecliptic. The plane of the node and inclination of the orbit being thus found from several triplets of places independent of each other, a medium of the results may be considered as tolerably accurate.

COMET, to determine the parallax of a. See Parallax.

COMET, trajectory of a. See Trajectory.
The Elements of Ninety Seven Comets.

<table>
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<tr>
<th>No.</th>
<th>Passage through the Perihelion in Mean Time at Greenwich</th>
<th>Longitude of the Perihelion on the Orbit of the Comet</th>
<th>Perihelion Distance, that of the Earth being 1</th>
<th>Longitude of the ascending node.</th>
<th>Inclination of the Orbit.</th>
<th>Mon.</th>
<th>Authors who have calculated the Orbit, and Remarkt.</th>
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**Notes:**
- Halley's comet was named after Edmond Halley, an 18th-century English astronomer who predicted its return in 1758 after its previous appearance in 1682.
- The comet's orbit is elliptical and it travels around the Sun, sometimes passing close to Earth.
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**Comet.**

- D. Mechain, nearly
- R. Mechain
- R. Chev. d'Anges
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- D. Mechain, vide Mem. de l'Acad. 1786
- R. P. de Sarcon, vide Mem. de l'Acad. 1787
- R. Mechain, vide Mem. de l'Acad. 1788
- D. Mechain
- R. De Sarcon, vide Connoissance des Tems
- D. Mechain
- R. La Lande
- D. Zach
- Bouvard
- Prospéra
- R. Olbers
- Bouvard
- Burchhardt
- Burchhardt
- R. Mechain
- Von Zach vide Connoissance des Tems, an. 12.
- Burchhardt
- R. Mechain, De la Lande thinks it may be the same as N° 37
- Burchhardt
- D. Mechain, vide Conn. des Tems, an. 14
- D. Gauffe, vide Connoissance des Tems, an. 15
- D. vide Connoissance des Tems, an. 1808
- D. Legendre, vide Nou. Meth. pour la Del. des Orbites
- D. Legendre, vide des Comet.
COMETARIUM.

On the subject of Comets, see Newton's Principia, lib. iii. Halley's Synopsis of Comets; Sisson Ellai fur les Cometes, 1755; M. Pingre's Cometographie, 2 vols. 1781; Sir H. Englefield's work "On the determination of the Orbits of Comets," M. Bode's General Considerations on the situations of the Orbits of all the Planets and Comets which have hitherto been calculated, in the Memoirs of the Academy of Sciences of Berlin; Dr. Gregory's Astronomy; O. Gregory's Treatise on Astronomy, 1803; De la Lande's, l'Academie des Cometes, 1759, and Astronomie, vol. iii; An Account of the Discoveries concerning Comets, with the way to find their Orbits, &c. by Mr. Wm. Herschel. Viz., Astronomy, &c. 1757.

COMETARIUM, or Cometarian, in Mechanics, is the name of a machine, contrived by Dr. Desaguliers, for the purpose of exhibiting and explaining the eccentric motion of a comet, agreeably to that law of planetary motion, by which equal areas are described by the radius vector in equal times. Dr. Martin has given an account of this machine, in his "Young Gentleman and Lady's Philosophy," and Mr. Ferguson has described it still more particularly in his "Astronomy," but as those authors have not given a perspective view of the parts of the machine, we have thought it necessary to give a new drawing, such as we conceive will render the mechanism clearly intelligible to every reader. In Plate I. of Planetary Machines, fig. 1, represents the cover of the cometarium, taken from the box which contains the wheel-work, and fig. 2, shews the box and its contents, with the exception of the cover, and one side, the latter of which is hinged to be removed, in order to disclose more fully the disposition of all the contained parts. A bin, fig. 2, is the bottom of the box, which supports the lower pivots of the three vertical arbors; C is a longitudinal bar inserted into the ends of the box, and bearing the upper pivots of the said arbors, as may be clearly seen in the figure; E is the handle put on the end of the horizontal arbor F, which arbor is pivoted into the front and back sides of the box; on this horizontal arbor, under the letter C, is an endless screw actuating the wheel G, with teeth not rounded but cut a little obliquely; the number of which teeth may be ascertained, to correspond to an aliquot part of a circle, suppose 720, in which case one tooth, or revolution of the handle, will correspond to 5°; at the inferior end of the arbor of wheel G, is fixed another wheel H, of the same number of teeth, that actuates a similar wheel I, on the second vertical arbor; so that these two wheels, H and I, also revolve each in 4° part of a circle, or 5°, at each revolution of the handle. Mr. Ferguson has placed the endless screw as in fig. 2. of Plate II., between the wheels H and I in such a way, as to impel them both in contrary directions at the same time, which construction is still more simple, as it dispenses altogether with the wheel G, and requires no rounding of the teeth; to the arbor of wheel I a solid plate K, in the form of an ellipse, is fixed at a point out of the centre, and has a groove round its edge to admit a cord to pass round it; and a second elliptic plate L, every way similar to plate K, is attached, at a point equally distant from the centre, to the third vertical arbor, but in such a way, that, when an endless cord is made to embrace the grooves of both, after crossing between them, the long radius of one is always directed towards the short radius of the other reciprocally, so that as the radius of plate K continues to lengthen in revolving half round, the radius of L continues to shorten, and vice versa during the other half of the revolution; this alteration of gradual lengthening and shortening of the radii, of the equably moving elliptic plate K, produces an alternate acceleration and retardation of motion in the plate L, such as corresponds with the equated motion of a heavenly body, describing equal areas in equal times; and the quantity of eccentricity given to the elliptic plates determines the quantity of the greatest equation in the orbit to be represented. Above the cross-bar CD is fixed an elliptic plate M, by two screws, seen in both the figures, round which the comet O is confined to move in its motion round N, the sun, which is a ball attached to the superior end of the arbor of the plate L of unequal motion; to the ball N, the arm or radius vector NO is attached, which therefore also moves with alternation, or receives with plate L; and as the comet O has liberty to slide along the radius vector, while a fluid under it penetrates the black elliptic groove, made in the cover round the plate M, the variation of distances is thereby effected as the comet is carried round: the point of the greatest distance, where the motion is slowest, is called the aphelion, from αφελς, from, and οψω, the sun, and the point of nearest distance, where the motion is quickest, is called the perihelion, from περί, round, and οψω, the sun. The two circles of signs, and also the graduated ellipse, are marked on the cover of the machine, and the arm G, in fig. 1, is placed on the equably moving arbor of wheel G, in fig. 2, so that when the arm G moves through the signs in the small circle, by equal areas in equal times, the arm NO movable round the point N, passes through corresponding unequal areas in the larger circle of signs, while the difference between the places of the two said arms shows the quantity of proportional, or equation in any situation in the large graduated circle, which is assumed to be parallel to the comet's motion. In order that the nature of the comet's motion may be the more apparent to the eye of a spectator, when referred to its own orbit, the small elliptic, beyond the darkened aperture that regulates the distances, is also divided into signs, but in such a way, that the angles subtended by each sign, when referred to the point N, or centre of motion, are unequal among themselves throughout each six successive signs, and if lines were drawn from each point where the comet is found at the end of each day or week, to the point N, they would include equal areas, or plane surfaces taken geometrically; in some of the machines indeed, those lines are actually drawn, and the separate triangular areas corresponding to each equadial period are painted alternately black and white, to render the doctrine of the celebrated Kepler still more evident to the eye. The principal objections to the construction of the machine before us is, that the comet O is apt to move by jerks in certain parts of the orbit, particularly when the eccentricity is great; and also the cord is liable to slip in some situations, without producing the corresponding motion in the elliptic plates K and L; the latter of which objections has been attempted to be obviated, by attaching forked pieces of metal to the plate of one of the elliptic plates near its end, and pins to the other, as in fig. 2. Plate II. to form a kind of teeth; but a better plan, and which has been adopted sometimes in practice, where the eccentricity is not very great, is to cut the elliptic plates themselves into toothed wheels, and to substitute for them the wheels H and I, in which case the cord may be dispensed with altogether, and the arm NO, we presume, will thus be less liable to jerks.—After all, however, this machine does not profess to represent the period of a revolution of any of the comets or planary bodies, but is intended merely to explain the law of their motion, which it will do in a very satisfactory manner, when well made; and it is easy to see, that, as the plate M may be fixed more or less out of the centre, such a change of distance
distances may be produced, as shall correspond to the changes of angular velocity; which is the chief difficulty to be overcome in the mechanical representation of the orbit.

New Cometarium by Mr. Jones.

Subsequently to our writing the preceding account of the cometarium, Mr. W. Jones, optician in Holborn, has favoured us with a drawing and description of a new construction of the cometarium, which he says is free from the jereks that we have stated as an objection to the plan of Dr. DeFageliers, and which, therefore, we lay before the public as nearly in the author's own words as our arrangement and observations on it will admit.

Fig. 1. of Plate II. of Planetary Machines is a representation of the external part of the machine, which is not confined to any particular dimensions, but has generally been made as follows; viz. A B C D is a mahogany box, about 12 inches long, 9 wide, and 4 1/2 deep, containing the wheeless that gives motion to the comet \( x \); the dark elliptical space is a groove representing the orbit of the comet, which is carried round in the direction of the alphabetical order of the letters. The point \( a \) is the perihelion, and the point \( g \) the aphelion; and the triangular spaces or areas, \( a S b, B S e, \&c. \) are all respectively equal to each other: in one turn of the handle \( N \), the comet \( x \) is moved over one of these areas; consequently, in the same time that it moves from \( f \) to \( g \) or from \( g \) to \( b \), it moves from \( m \) to \( a \), or from \( a \) to \( b \), and in like manner through each succeeding area, the quickest motion being at \( a \), and the slowest at \( g \); thus showing that the velocity of a comet in its orbit continually and gradually decreases from the perihelion \( a \) to the aphelion \( g \), and increases in the same proportion from the aphelion to the perihelion. The elliptical orbit is divided into twelve signs with their respective degrees, and in a similar manner is the circle no p a t, which represents a great circle in the heavens, and to which the motion of the comet is referred by the extremity of the wire \( W \), movable at \( S \), and actuated by the stem of the comet, which slides against it, in and out alternately, in its progress in the orbit. During the comet's motion in its orbit from \( f \) to \( g \), its apparent motion is only about five degrees in this circle, as pointed out by the end of the wire \( b \); but in the same time as the comet moves from \( m \) to \( a \), or from \( a \) to \( b \), it appears to describe the large angular space \( t a, o \) or \( n \) in the heavens, each of which arcs contains about \( 30^\circ \), or four signs; and if the eccentricity of the orbit be more or less greater, the greater would be the difference between the two extreme velocities. The figures 1, 2, 3, 4, \&c. to 12, represent a small comparative circular orbit, for shewing the equable motion of a body, supposed to move concentrically round the sun \( S \), and to describe equal arcs, as well as equal areas, 1 S 2, 2 S 3, \&c. in equal times with those of the comet \( x \) in its elliptic orbit before mentioned. Suppose now the bodies \( n \) and \( o \) to commence their motions at the same instant from the points \( a \) and \( i \), and to arrive at the same respective points again, after a revolution of each, at the same instant, it will be observed, during their progress, that the body \( n \) will be more forward than the body \( o \) in the first six signs from \( a \) to \( g \), but more backward in the next six signs from \( g \) to \( a \), and the difference between the places of the two bodies, in any part of the small or equable orbit, will be the equation of the centre in that particular part. At the points \( a \), 1, and \( g \), 7, the bodies are together, and consequently the equation vanishes, and from thence begins to take an opposite character, changing from plus to minus, and vice versâ at the respective points; also, the distance from the aphelion point, in the small orbit, is called the mean anomaly, reckoned in signs and degrees; and the distance from \( a \) in the large circle, reckoned in a similar manner, is called the true or equal anomaly. Thus the reason appears evident, why, in astronomical calculations taken from the tables of Dr. Halley, or La Lande, the grand equation of a body moving in an elliptical orbit is additive in the first six signs, and additive to the second six, with respect to the place anterior to an approximation of mean motion; and the same application of the grand equation, after some modification of its varying quantity, is used from the apex to the perigee, and back again from the perigee to the apex of the lunar orbit.

The mechanism, by means of which these motions are produced in the original cometarium, has been already explained above, from which that of Mr. Jones is very different, and is thus explained by him.

From the circumstance of its being considered as impracticable to obtain an easy and uniformly ready motion of a comet, by Dr. DeFageliers's mechanism, Mr. Jones has adopted the plan of using only one great wheel revolving on an arbor placed out of the centre, agreeably to the drawing exhibited in fig. 3, of Plate II. near the point \( I \), and under the cock attached to the plane of the wheel, by three visible screws. The different parts and action of the mechanism are these; \( A B \) represents the inside bottom of the box, seen in fig. 1, of the same plate; \( C D \) is an oblong piece of mahogany, fitted to as to slide easily but flexibly into the grooves of two parallel side-pieces of the frame wood, made fast to the bottom, and denoted by the letters \( E \) and \( F \); \( G \) is the large brass wheel, about five inches diameter, which we have said revolves on an eccentric arbor, near the point \( I \); over this point is placed the cock, or bent arm, \( H \), with an oblong slit through it, to receive the sliding piece \( a \), which piece supports the lower end of the frame that carries the comet \( X \) in fig. 1. \( K \) and \( L \) are two wheels pivoted above into a bridge \( P \), shaped like a crook, and have equal numbers of teeth, the latter of which wheels is actuated by the contrarate wheel \( M \), inserted on the axis \( B \), of the handle \( N \); on the same arbor with \( K \), and close under the bridge \( P \), is a small wheel (seen in the figure) that impels the large wheel \( G \), round its eccentric arbor; it will not perhaps appear evident to an ordinary mechanic, how the action of the small and large eccentric wheel is rendered continual, and the pitching of the teeth made good all round the great wheel, notwithstanding the constant changes of the distances from the eccentric point, which is the centre of its motion, and the successive points of its circumference; to effect this apparently difficult purpose, considerable ingenuity was necessary; by examining the crooks and rim of the large wheel, it will be seen, that the thicknees of the crooks, and of the teeth, is less than of the rim, so that the rim may be laid to have a circular edge-bar on its plane projecting upwards; this edge-bar is embraced by two rollers, the larger one moving round on the arbor of wheel \( K \), above the small wheel, and the smaller one carried by a cock \( O \), fall to the crooked bridge \( P \); so that, as the great wheel is urged round by the small one, these two rollers give motion to the sliding piece of wood \( C D \), alternately in and out, and consequently bring the teeth of the wheel borne by this sliding piece, into a proper depth to act with its small impelling wheel, in every part of the revolution of the former, which therefore acts as well, when the teeth are directed towards the centre of motion, as if the arbor had been in the centre of the wheel, and placed on a stationary bar. The wheel, however, has many more teeth coming successively into action during one half of its revolution, round the eccentric point of its motion, than it has during the other; and on this circumstance depends the variable velocity of the comet attached
to its arm I, as it regards the said centre of motion. We shall have occasion to shew, in another place, that the equation, produced by this cause only, would be just one half of the proper equation of the centre, or very nearly so, provided the fun were placed exactly over the centre of motion, or eccentric point of the wheel: it is also not difficult to shew, that if the wheel had no eccentric motion, but had the fun placed at a similar distance out of its centre of motion, one half of the due equation would also, in that case, be effected, supposing the circle of funs, point ed to by the wire, to be eccentric with regard to the wheel, and supposing the fun to be in its centre; now, in the instrument before us, these two causes operate together to produce the total equation due to the orbit, where the eccentricity of the wheel is to its radius, and also the eccentricity of the fun's position, at the opposite side of the wheel's centre, to the same, as the eccentricity of the comet is to the radius of its orbit. It must, however, be acknowledged, that the joint agency of the two said causes of the equation, supposes the sliding bar CD to be stationary, in which case the action of the wheels would be impeded; consequently, that part of the equation which depends on the fun's eccentric position, as it regards the wheel's arbor, is variable, and in some measure must determine the scale or equation. As it would have been, if the wheel's arbor had been stationary; the remedy for this small deviation from perfect accuracy in the scale of equations thus produced by the joint agency of three causes, is best effected by making the straight lines, that form the triangular areas, to correspond, not to a geometrical measurement, but to the actual turns of the handle, one of which will correspond to each triangular area, when the centre wheel M, and also the small wheel over K, have each one twelfth part of the number of teeth that the great wheel has, which wheel, in that case, may have any optional number that is divisible by twelve. When the centre of the large wheel lies exactly in a line joining the centre of motion H, and the arbor of K, the sliding board C D is the most pulled out, and the comet is at the aphelion A, fig. 1., moving slowly; but when the centre of the wheel's motion lies between the central point of it and of wheel K, then the comet is at the perihelion a, moving quickly. The cock y, in fig. 1., holds the elliptic plate, with the triangular areas marked on it, and bearing on it the fun, in such a situation, that the groove round its edge, in which the stem of the comet moves, limits the distance at all times of this body, as it respects the fun, which is done by making the sliding piece in fig. 3, move in or out in the slit of the arm 1, already described. Thus the jerks of the old cometarium are avoided, and all its apparent properties are preserved, except that a portion of the large graduated celestial circle is unavoidably concealed by the superior elliptic plate of triangular areas.


COMETITES, in Natural History, a name given by some writers to a kind of allrostes, which has flars much larger than those of the common kind, and therefore called comets.

COMEUS, in Mythology, a surname of Apollo, under which title he was worshipped at Seleucia, whence his statue was carried to Rome, and placed in the temple of Apollo Palatine.

COMETS, STONY, in Natural History, drop-flores or confets. These are flascles, broken into short pieces, somewhat resembling comets, and certain kinds of suggar-plums, and which in Italy and other places are sometimes put up in boxes and labelled, so as to deceive strangers at first sight, in supposing them to be real comets.

COMFLOENTA, in Ancient Geography, a town of Spain, in the Tarraconian territory, placed by Ptolemy in the country of the Arcavi.

COMFORT. POINT, in Geography, is the south eastern point of Elizabeth county, in Virginia, formed by James river, at its mouth in Chichapay bay; 19 miles W. by N. of Cape Henry.

COMFREY, or COMPHRY, in Botany. See Symphytum.

COMHOLA, in Geography, a river of Ireland, which runs into Bantry bay; 3 miles N. of Bantry.

COMI, in Ancient Geography, a people of Asia, in Bactria, faid by Ptolemy to have dwelled in the vicinity of the Chomari.

COMIDAVA, a town of Dacia, according to Ptolemy.

COMILLAH, in Geography, a town of Hindooistan, in the province of Bengal; 160 miles E. N. E. of Calculor, and 176 E. S. E. of Moorhredabad. N. lat. 23° 25'. E. long. 91° 15'.

COMIN and COMNOT, two small islands in the Mediterranean, lying between Malta and Gozo; the former supposed to be the Hephestia, or isle of Vulcan of the ancients. They were formerly uninhabited; but by the care of Vircnacourt, a fort having been built upon each of them for their safety, they have been since partly inhabited, and that of Comin, which is about 4 or 5 miles in circuit, breeds a large quantity of cattle. See MALTA.

COMINES, a town of Flandres, situated on the Lis, which divides it into two parts; formerly a considerable place, but reduced by war and various accidents; 25 miles S. of Brussels, and 7 N. of Lille.

COMINGE, in Military Language, a shell of uncommon magnitude, which takes its name from the person who invented it.

COMING-TO, in Sea Language, denotes the approach of a ship's head to the direction of the wind.

COMINNIUM, in Ancient Geography, a town of Italy in Samnium, which did not subsist in the time of Pliny.

COMIOLA, in Botany, a name given by some of the old Roman authors, to the plant commonly called Lutellia, or dyers' weed.

COMITATU commissio, in Law, a writ or commission, by which a sheriff is authorized to take upon him the charge of the county.

COMITATU et astro commissio, a writ by which the charge of a county, together with the keeping of a castle, is committed to the sheriff.
COMITATUS, in Law, a county. Inculphus tells us, that England was first divided into counties by king Alfred; and the counties into hundreds. and these again into tvythings; and Forte-Cuce writes, that regnum Anglie per comitatus, ut regnum Francie per bellavitnos, diftinguitur. Sometimes it is taken for a territory or jurisdiction of a particular place; as in Mat. Paris, anno 1234. See County.

COMITATUS, pp. 73. See Posses.

COMITIA, an assembly of the Roman people, either in the Comitium, or Campus Martius, i.e. Field of Mars; meeting for the election of magistrates, or for consulting on the important affairs of the republic.

The word comes from the verb cceo, or cemo, to go together.

There were certain days fixed for these assemblies, called dies comitiales; marked with a C in the calendar of Julius Cæsar. Comitial assemblies, held for the election of consuls, were called comitular comitia, in like manner, the other comitia took names from the officer to be created; whether a tribune, a pontiff, addie, or the like.

There were three kinds of these comitia: viz. curia, centuria, and tributa, so distinguished from the manner wherein the people voted, and gave their suffrages, viz. by curia or parishes, tribes, or centuries.

The power of calling these assemblies was vested in each of the chief magistrates, and sometimes to the foreign pontiff.

The authors make the difference between comitia curia and comitia curiata, to consist in this: that in the former the whole people were called together, in the latter only a part.

Comitia curiata. Romanus instituted the comitia curiata, or the public assemblies of the people, called to vote in their several curiae; and it is agreed by all that the matters subjected to their decision, were the choice of all the magistrates, and the right of making laws, war, and peace: an ample jurisdiction, comprehending the most important articles of government, yet not wholly absolute, according to Dionysius, unless the Senate were conjoined with them. This method of transacting all the greater affairs by the people, assembled in their curiae, after it had continued through five successive reigns, was found to be inconvenient.

Servius Tullius, the sixth king of Rome, in order to correct the inconvenience of the comitia curiata, instituted a new division of the people into six classes, according to a cenus, or valuation of their estates; whence proceed the comitia centuriata: then he subdivided these classes into one hundred and ninety-three centuries, and contrived to throw a majority of these centuries, that is, ninety-eight of them, into the first class of the richest citizens. By which regulation, though every man voted now in his century, as before, in his curia; yet, as all matters were decided by a majority of the centuries, so the balance of power was wholly transferred into the hands of the rich; and the poorer were deprived of their former weight and influence in the affairs of state: which wise institution was ever after observed, through all succeeding ages, in the elections of the principal magistrates, and the determination of all the principal transactons of the republic.

COMITIAL days. Paulus Manutius is of opinion, that there were certain days on which the Roman senate might regularly be assembled; and others on which it could not: and that these last were called comitial days, and marked under that name in the calendars, as days wholly defined, and set apart by law, for the assemblies of the people. But Sigerinus contends, that the senate might meet on any of those days, unless when the people were actually assembled, and transacting business on them; and consequently that the title of comitial denoted such days only, on which the people might be legally assembled, not such on which they were of course to be assembled. Middlet. of Rom. Senat. p. 138, fct.

The truth of the matter seems to be this, that though the days called comitial were regularly defined to the assemblies of the people, yet the senate also might not only be convened on the same, but the comitial assemblies were dissolved; but had the power likewise, whenever they found it expedient, to supercede and postpone the assemblies of the people to another day; and, by a particular decree, to authorize their own meetings upon them, for the dispatch of some important affair therein specified.

COMITIALIS morbus, in Medicine, an ancient term for the epilepsy, or falling sickness; so called, because if any person was feized with it in the Roman comitia, the assembly was immediately dissolved; this being esteemed an unholy omen; or, rather, because those liable to it were chiefly feized in the comitia, or great assemblies. See Eeplepsy.

COMITIUM, the place where the comitia were ordi-

narily held, which was a large hall in the Roman Forum: it was a long time open at top; on which account the assemblies were often interrupted by bad weather: it was first cov-

ered over in the time of the second Punic war. See Forum.

Rofinus observes, that the consuls and tribunes were not created in the comitium, but in the Campus Martius.

It was in this place that the rostra were placed. See Comitia.

COMITLAN, in Geography, a town of North America, in Mexico, and province of Chiapa.

COMITOLO, Paul, in Biography, one of the ablest of the society of Jesuits, acquired great reputation by his instructions in morality and theology at the commencement of the seventh century. He died in 1626, at the age of eighty years. His publications are "Catena illustrium authorum in Librum Job," translated from the Greek into the Latin language; — "Concia fei. responsa moralia;" "Defrinita de contractu univerello." Nouv. Dict. Hift.

COMMA, in Grammar, a point, or character, formed thus [ ]; serving to mark a short stop, or pause; and to divide the members of a period.

The word is formed from κόμμα, seco, I cut.

It is very difficult to fix the precise use of the comma; different authors define and use it differently: the ordinary doctrine is, that the comma serves to distinguish nouns, verbs, adverbs, and the several parts of a period that are not necessarily joined together. But this conveys no clear, precise idea; for what is it to distinguish the parts of a period not necessarily joined together? F. Buffier has carried the doctrine of the comma farther: according to him, the comma serves to distinguish those members of a period, in each whereof is a verb, and the nominative case of the verb. Thus, "That so many people are pleased with trifles is owing to a weakness of mind, which makes them love things easy to be comprehended."

Besides this, the comma is used to distinguish, in the same member of a period, several nouns sublittantive, or nouns adjectives, or verbs, not united by a conjunction. Thus, "Virtue, wit, knowledge, are the chief advantages of a man:" or, "A man never becomes learned without studying constantly, methodically, with a just application, &c."

If those words be united in the same phrase by a conjunction, the comma is omitted: thus, "The imagination and the judgment do not always agree." The comma may also be omitted between the phrases that are very short; especially
if they depend upon the same regimen, and are united by a conjunction: thus, "Alexander conquered Asia and established the monarchy of the Greeks."

The legumineous author of the tract "De Ratione Integrap-


1724. lays down the use or a comma to be, to dilate the

time in a period, or sentence; i.e. such as only contain of one subject, and one definite verb. Thus Cicero, "Neque neque ad volupates agricorum, quibus ego

credibiliter delictor. qua sic ut ilia impedimentum lente, & nihil ad lapsus vitam proxime accedere videtur," See Sentences.

But this rule does not go throughout; the same author

denouncing many particular cases, not included herein, where yet the comma is allowable.

Sometimes, e. g., a proposition includes another, which

may be called parenthetical, as being only a part of the entire

phrase: in which case, the two are to be divided from each

other by commas. Thus, "He always says, as he tells us,

the finest things in the world."

The points, or pauses in discourse, it is observed, are in a

kind of musical proportion: the comma marks the reader's

voice while he may privately tell one; the semi-colon, two;

the colon, three; and the period, or full-stop, four. Others

make the stop at the colon four: and the period fix.

Professor Ward observes, that the pause of the voice

should be twice as long for a comma, as between words separated by no mark of distinction; thrice for the semi-

colon; and so in the fame proportion. Bishop Lowth

subdivides the period a pause in duration double to the cola-

to the colon, double of the semi-colon; and to the semi-

colon, double of the comma: so that they are in the fame proportion to one another as the semibreve, the minim, the

crotchet, and the quaver in music. But whatever be the

duration of the several pauses, the proportion between them would be ever invariable, if the doctrine of punctuation

were exact. Intro. to English Grammar, ed. 1772.

p. 157.

The ancients only made use of two kinds of points, or

pauses, in a period; the larger they call members, the Greeks

 latina, marked thus [, ]; the smaller interius, the Greeks com-

ma, thus [, ].

The moderns, resuming on their predecessors, have subdi-

vided the first into a colon, and semi-colon; some lay, with-

out any good foundation in nature; though others maintain

the usefulness of the division.

As the member, or colon, divides the period into two parts,

each containing a fonce, though that imperfect: thus, "An-

tequam de republica, patres conscripti, dicas ea que dicenda

hoc tempore arbitratus," where the fonce does not resist, nor

is the period or sentence perfect, without the addition of

"e exploited vobis breviter & profectio & reverberationes

meas:" the comma subdivides each interval into intermediate
divisions, which, of themselves, have no precise meaning at all: e. g., "Nihil e. mihi credo, virtute formosum, nihil

pulchrum, nihil amabile." From these considerations, and on other occasions they promote perspicuity and dihincnclas, and cafe the reader, both in the
teachful and comprehension of his author; so, in oratory, are of especial use and effect; particularly where an adver-

tory is to be closely and pointedly attacked, upbraided, re-

prehended, wounded, &c. Witness that of Cicero against

Verres: "Non enim nos color urbe fervis, non pilos optime,

non dentes putridi deceptemur: osculum superificia, frons,
vulps denique totus, qui fera quidam tacitus mentis est,
hic in fraudem, homines impulsit: hic, eos, quibus crat

ignotus, deceptor, feclitus, in fraudem induxit: pauci tua ita

inutentia vitia novimus; pauci tarditatem inerzium, fluporem,
debilitatque linguam," &c. On the use of commas, see

Murray's English Grammar, ed. 8. p. 224, &c.

Comma, in Music. By this term, theoretic writers on

music have denominated several different small intervals in

the musical scale, which makes it necessary that we should

here enter rather minutely into the subject. We shall begin

with that very essential interval in almost all musical calcula-

tions which is for the most part implied by the word comma

without further addition, otherwise the

Comma Major, Greater Syntonic or Elementary of va-

rious writers, being also the schisma or schifma of Des Cartes,

Holden, and others. This interval seems first to have been

noticed by the Greek writers, as the quantity by which the

major tone $\left(\frac{1}{14}\right)$ exceeds the minor tone $\left(\frac{1}{15}\right)$; its ratio is $\frac{14}{13}$ and its value in the common or Briggs's

logarithms is .5944096811, or when reckoned down-

wards $\log_{10} \frac{14}{13} = 0.0532$, and in the logarithms of Euler

.07904; this last being, in fact, its decimal value, com-

pared with the octave $= 1$. This comma is usually marked

C, and is equal to $11.0078631$ times the schifma $\left(\frac{2}{3}\right) = 1.0078631$ times the kifer fraction $\left(\frac{2}{3}\right)$ = to

$1.10078631$ the comma fraction $\left(\frac{2}{3}\right) = 1.10078631$ the minute (m), and is to $= \frac{1}{12}$ the octave nearly.

It is equal to the sum of $11$ schismas and a minute, ($1 \times 11 + m$), or of a minor comma and a schifma: it also

refutes as the difference or remainder, after subtracting

the following intervals from each other, viz. a schifma from a dia-

chifma, a minor comma from an enharmonic schifma, a

semitone minor from a femitone medius, a femitone medius from an apotome, (here observing that $\frac{4}{13}$ is the apotome and not

$\frac{4}{12}$, erroneously printed in our article), an enharmonic schifma from a femitone minimum, a linna from a femitone

major, a femitone major from a femitone maximum, a femitone

subminimum from a femitone minor, &c. The comma major

is equal to the following additions of intervals, in triples, viz.

two schismas, a medius residual and a major residual; three

schismas, a minor residual and a major residual; five schismas, a

kifer fraction and a major residual; ten schismas, a kifer fraction and a greater fraction; ten schismas, three kifer frac-
tions and a medius fraction, &c. See these several articles.

The curious, and those concerned in these kinds of calcula-
tions, will find a great variety of other relations, in which

the comma major illands, to the musical intervals, both great

and small. in the elaborate manuscript treatises on music by

the late Marmaduke Overend, organist of Ilfracombe, and by the

late Dr. Boyce, which Dr. Callcott lately presented to the

library of the Royal Institution in Albemarle-street; after

kindly permitting the writer of this article to peruse and ex-

tract from them the use of this work. The ratio of

the major comma may be resolved into the component

primes $\frac{2}{3}, \frac{3}{4}, \frac{2}{3}$, and then, according to the method of

Mr. Fary in the Philosophical Magazine, vol. xxvii. p. 195,

(see our articles Musical Primes, and Tuneable Intervals)

can be resolved into factors $\frac{2}{3}, \frac{3}{4}, \frac{2}{3}$ or two fifths ($\frac{2}{5}$) reversed, a fourth ($\frac{2}{3}$) and a major sixth ($\frac{2}{3}$); whence it appears, that

the interval of a major comma can be tuned on an instrument,

having sufficient number of limbs or tones, by taking two

fifths downwards in succession, and thence upwards a major

sixth, and a minor fourth in succession, or $\frac{2}{3} + \frac{2}{3}$

where it is observable, that two Veas might have been tuned

upwards, and a V and 4th downwards, which would also

produce the interval of a major comma; but above the

fifths k key note, instead of below it, as in the first case,

where $\frac{2}{3} + \frac{2}{3}$ is a negative quantity, as well as all the

following. The fraction $\frac{2}{3}, \frac{3}{4}, \frac{2}{3}$ does not at first appear capable of division into any other tuneable ratios, than
than the above; but, if we multiply the same by \( \frac{1}{4} \), it will then be resolvable into the factors \( \frac{1}{4}, \frac{1}{4}, \frac{1}{4}, \frac{1}{4} \), and may be tuned thus: \( 2 \times 161 = 322 \). If we multiply \( \frac{3}{4} \) by \( \frac{1}{4} \), we can obtain 2 fourths \( - V - 3 \); or if by \( \frac{1}{2} \), we can get 2 fourths \( + 3 \); or if by \( \frac{3}{2} \), we may get 3 fourths \( - 6 \); or if by \( \frac{3}{2} \), we shall have 2 fourths \( + 161 \); and thus, we have six methods of exactly tuning a major comma, either above or below any given note, by help of perfect intervals only.

The method above explained, of analysing musical ratios or intervals, and expressing them in different ways, by the use of tuneable intervals only, is calculated to instruct the musical student, in the curious and important relations which the several concordant intervals bear to each other: hence we see, for instance, that if in any chant, or passage in a melody, to be performed by voices, by violin, or other perfect instruments, any one of the above six successions of notes were to occur, and the intervals were all to be performed perfectly, or without temperament in the melody, the conclusion would not be in the key-note, or that set out from, but a comma different in pitch, which property of the musical scale is called divergency of time, see that article.

It is observable, that all of the above six successions or passages in melody, which diverge a comma, contain two fifths or two fourths, each moving the same way, and to which the divergency seems attributable, when the comma is not counteracted by a proper succession of other commas. Mr. Maxwell in his "Reformed or Complete Diatonic Scales for the Organ and Violin," &c., in his "Essay on Tune," and so does Overend in his manuscripts, proposes to mark the rise of a comma by the acute accent ('), and the fall of the same comma by the grave accent ("), and that when either of these is required to be taken off, this mark (°) is to be used in the writing of music, in the same way as the musical mark of use, to take off or destroy the effect of a & or b, which has gone before, either accidentally, or in the figure of the staff. Mr. Maxwell adds, how a violin performer may practically tune a comma upon his instrument, in a variety of ways.

Modern writers on the temperament of the musical scale, usually refer their temperaments, or small corrections, to be applied to the concords, to this major comma as a unit or standard, on which account we shall present our readers with some further particulars relating to this small interval of the scale. Dr. Robert Smith, in his "Harmonics," Lemma to the 9th proposition, cor. 4, has demonstrated, that if any part or parts of a comma \( c \), denoted by \( \frac{c}{p} \), be the interval of imperfect unisons (or temperament), the radius of the times of their single vibrations will be \( 161 \times p - q \) to \( 161 \times p + q \), extremely near: for example, if we want a finite or approximate ratio for a \( \frac{1}{2} \) of a comma, we have \( q = \frac{1}{4} \), \( p = 4, \) and \( \frac{161 \times 4 - 1}{161 \times 4 + 1} = \frac{643}{645} \) is the ratio, the complement arithmetical of its logarithm being \( 1.2387 \), which is true to the last of 7 places of figures: in like manner, \( \frac{161 \times 3 - 1}{161 \times 3 + 1} = \frac{483}{484} \) or \( \frac{241}{242} \) is the ratio answering to \( \frac{3}{4} \), or \( \sqrt{\frac{80}{81}} \), which is also true to the last of 7 places in the logarithm, and is sufficiently accurate for all purposes: but it must be noticed that these are not composed of musical primes.

It may be of use here to inquire, what proportion the major comma, or ratio of \( \frac{80}{81} \), bears, to the hemitone or ratio of \( \frac{15}{16} \); for which purpose we have the logarithm of the latter divided by the logarithm of the former, or \( \frac{80}{81} \) is \( 5 \times 0.9528 \), the number of major commas in one hemitone (or H) nearly: and as it may be useful on many occasions for the student to know, how many major commas make up any interval, we have added a short table, shewing very exactly how many major commas make up the different concords within the octave, and also some of the smaller discords.

<table>
<thead>
<tr>
<th>Intervals</th>
<th>Ratios</th>
<th>N. of Commas</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIII</td>
<td>( \frac{1}{1} )</td>
<td>55.797626</td>
</tr>
<tr>
<td>VI</td>
<td>( \frac{1}{2} )</td>
<td>41.120938</td>
</tr>
<tr>
<td>6th.</td>
<td>( \frac{1}{3} )</td>
<td>37.824681</td>
</tr>
<tr>
<td>V</td>
<td>( \frac{1}{4} )</td>
<td>32.635926</td>
</tr>
<tr>
<td>4th.</td>
<td>( \frac{1}{5} )</td>
<td>23.158110</td>
</tr>
<tr>
<td>III</td>
<td>( \frac{1}{6} )</td>
<td>17.06288</td>
</tr>
<tr>
<td>3rd.</td>
<td>( \frac{1}{7} )</td>
<td>14.676924</td>
</tr>
<tr>
<td>II</td>
<td>( \frac{1}{8} )</td>
<td>9.48144</td>
</tr>
<tr>
<td>I</td>
<td>( \frac{1}{9} )</td>
<td>8.48144</td>
</tr>
<tr>
<td>2nd.</td>
<td>( \frac{1}{10} )</td>
<td>5.19528</td>
</tr>
<tr>
<td>comma</td>
<td>( \frac{1}{11} )</td>
<td>1.000000</td>
</tr>
<tr>
<td>Key</td>
<td>( \frac{1}{12} )</td>
<td>0.000000</td>
</tr>
</tbody>
</table>

From the above table it appears, that the octave, whose ratio is \( \frac{1}{1} \), contains something more than \( \frac{55}{2} \) major commas, the VI a little more than \( \frac{41}{2} \) commas, &c. We shall next consider the

**Comma Minor, or Less,** of Rameau, Overend, &c., being also the apotome minor of Salomon de Caus, Boccius, &c., the diatetis of Euler, and the major dieis of Maxwell. This interval seems first to have been noticed by the Greek writers, as the quantity by which two semitones major \( 2 S = \left( \frac{15}{16} \times \frac{15}{16} \right) \) exceeded the tone major \( T = \left( \frac{8}{9} \right) \). Its ratio is \( \frac{2025}{2048} \), and its value in Briggs's logarithm \( \frac{0.95058057575}{10} \), which reckoned downwards, by its arithmetical complement, is \( \frac{0.94940924751}{10} \); and its value in Euler's logarithms is \( \frac{0.16295}{10} \). It is equal to \( 1.005863 \) times the sphiema of \( \frac{5}{4} \), and in \( 0.9009707 \), or nearly \( \frac{15}{8} \)ths of the major comma. It is equal to the sum of ten sfhemeas and one minute (\( 10 \times \frac{15}{8} ) \times \\text{minute} \). And it refutes as the difference when a sphiema is taken from a major comma, a sphiema from two major commas, two major commas from a semitone minimum, a major comma from an enharmonic sfhema, a semitone minor from a limma, an apotome from a semitone maximum, a semitone minimum from two enharmonic sphiemas, a semitone median from a semitone major, a lesser fraction from a prisma, two
 fix, • fee 2 - • 9 , intended the • 12 ^? 5,288 ° 3 " 2 1 ^

Grammar," this Nicola - —

Comma, Greater, has erroneously been afo to the interval 125 = 21 Σ + 2 m, which is the Embemotonic Diesis; see that article.

Comma, Minimum, according to some former writers, expresses the ratio 32768 = Σ, which is now called the Schisma; see that article.

Comma, Ancient, according to Galileo, had a ratio of 625 = 32 Σ + 3 m, which is now called the Semitone Minimum, which see.

Comma of Phidias is the ratio of 32 9 , intended as an approximation for 7th part of a tone major, but which it exceeds considerably; besides, the fraction 32 9 is not composited of the small or musical primes 2, 3, and 5, and cannot therefore be admitted into musical computations.

Comma of Boëtius, according to Gareanum, also of D.
 Nicol was 4th part of the tone major, or 11 2 9 + 2 f + m, whereof 5 made their semitone majus or apotome, and 4 made their semitone minus or limma; this interval was ancienly supputed by fome to be the fame with the modern diaphisma (12 Σ + m), but from which it differs, 4 11 9 f = 2 2 9 , or nearly half a schisma.

The ancients mention another comma of the tone minor, or 11 5 8 + + 4 1 f + m. (See Dr. Caiellott's "Musical Grammar," pages 119 and 49.

Comma, Artificial, of Nicholas Mercator, is the 72 part of the octave, or 11 2 5 3 1 f + m. (See Mercator's "Temperament of the Musical Scale").

Comma of Mercurinus. According to Holder's "Treatise on Harmony," page 104, Mercurinus divided the octave into about 58 parts, and called one of these a comma.

Comma of Galileo. The interval 32441 32488 called a comma in the writings of this author, was intended to have been the diaphisma or 33 48 , as Mr. Overend has shown, vol. i. p. 140, of his MS, before referred to; the error originated in an erroneous multiplication, in the second figure of Galileo's numerator, by which it was rendered unfit for the musical scale. (See Sir John Hawkins Hist. Mus. vol. i. p. 321.)

Comma and half of Galileo, has a ratio of 32 5 = 32 Σ + 3 m, which is the Semitone minimum; see that article.

Comma and half of Rameau. This interval refers from the addition of a major comma and a major residual, and is also the difference between a semitone subminimum and a hyperbole; its ratio is 3225125 , its common logarithm is 27505, whence it appears, from the process before explained, that 3 3 = 111, or five minor thirds upwards, and four major thirds downwards, furnish a practical method of tuning this interval above any note, and the reverse of this process or 111 = 4 would tune the fame below any given note.

Comma, Semi. See Semi-Comma.

Comma Redundant, or Superfluous, or deficient, or diminished; these terms are applied to such intervals, whether concords or discords, as exceed or fall short of the true ratio of that interval by a major comma, as a comma redundant fifth, a comma deficient third, &e. Sometimes the term comma is omitted in naming these intervals, as a redundant fifth, a deficient third, &e. See Fifth, Third, &c.

Commagene, or Commagene, Commagene, in Ancient Geography, a country of Syria, bounded on the west by mount Amanus, on the north by part of mount Taurus, on the eill washed by the Euphrates; and with regard to its southern boundaries, it is uncertain whether it is contiguous to Seleucia, Cyrrheftica, or both. It is near the north corner of Syria. This country is mentioned by Strabo, Ptolemy, Pliny, and Asmianus Marcellinus, but they assign to it different extents. Its chief cities were Samosata upon the Euphrates, its capital, Antiocia ad Taurum, Germanica, Singa, Chaonia, and several other cities, once of great note, but long since utterly destroyed. In the time of Antiochus the Great, Commagene was subject to the Syrians, and left to him by the treaty of peace which he concluded with Rome, after the famous battle of Magnesia; and hence it is probable, that it was feized by some of the princes of the Seleucan family, during their intestine wars, as no mention of the kings of Commagene occurs till the time of Pompey, and the names of those, who afterwards reigned there, are altogether Syrian. The first that is mentioned is Antiochus, who joined with Darius king of Media, in opposing the entrance of Pompey into Syria, after the defeat of Tigranes; but, being overcome in battle, he submitted to the conqueror, and was not only confirmed in his kingdom, but rewarded with part of Mesopotamia. In the civil war between Cesar and Pompey, he sent large supplies to the latter. Antiochus having been put to death by order of Augustus, for the affaffination of the Roman ambafador, was succeeded by Mithridates, on whom Augustus beffowed the kingdom of Commagene, in recompence of his services during the war with Antony and Cleopatra. Upon the death of Mithridates, Antiochus II., the son of Antiochus I., was permitted by Augustus to take possession
fot of the kingdom. This prince died in the reign of
Tiberius; and Commegane became a Roman province, and
due to the requests of the nobles, it was governed by a praetor.
But Caligula restored the kingdom to Antiochus III.,
the son of Antiochus II., adding to it the maritime parts of
Cilicia. He was succeeded by his son Antiochus IV., fur-
named Epiphanes, who distinguished himself under Vep-
phanes in his war with the Jews, and particularly at the
siege of Jerusalem. Vepphanes, however, having reduced Com-
megane to the form of a Roman province, would not allow
any of the sons of Antiochus to succeed him. This coun-
try was afterwards made part of the province called Augu-
stophratensis, or as Amminus has it, Euphratensis, and
was commonly known by the name of Euphratensis.

COMMAND, in French Commandement, in Military
Language; the act or action of him who commands; a thing
commanded; the right of commanding and making one’s
self obeyed. The movements of a battalion at exercise, are
performed by the words which the major or commanding
officer pronounces. Hence, the word of command is a phrase
in common use among military people.

COMMANDER, or COMMANDY, the person who
commands an army, a brigade, a garrison, a fort, castle,
regiment, company, &c.

COMMANDNE, a rope made use of for boats and pon-
toos.

COMMANDER, is a name given to a large wooden
mallet used in a ship.

COMMANDERY. See Command.

COMMAND in front, in Fortification, a height, or an
eminence, which is directly opposite to, or faces the work,
that it commands.

COMMAND in rear, an eminence or a height, which is
directly behind the work that it commands.

COMMAND in flank, or by enfilade, a height or an
eminence on the flank, or prolongation of any part of a
work, which is calculated and built

COMMANDMENT, Fr. A commanding ground,
an eminence or elevation, which overlooks a post or strong
place. There are three sorts of commandements; namely
the commandement in front, which faces a work, and batters
or fires on it in front; the commandement en revers, or in
revers, which is behind a work or place, and fires on
its rear either directly or obliquely; and the commandement
de courtine or en enflade, which is on the flank of a work,
and fires along the whole extent of a rectilinear part of
it. Nine feet in perpendicular height, constitutes a simple
command or commandement; 18 feet a double one; 27 feet
a triple one; and so on.

COMMANDMENT, Order of, among the officers of
infantry and cavalry. In France it was customary in a place of war,
and every inclosed city, for the officers of infantry to have
the command over those of the cavalry, and on the other
hand to be commanded by them in the open field.

COMMANDER, Fr. The commander of an order
of knights. In some orders of chivalry it is the title,
which a professed knight takes the moment he pronounces
the vows, that subjected him to celibacy without his
ceasing on that account to be military. There are, how-
ever, in some orders of chivalry, that do not require ces-
bacy on the part of the commanders.

Commandeur, in Orphicology, the French name of
Orpheus Phoenicis, which see.

COMMANDMENTS, FRUDERICK, in Biography, was born
at Urbino, in Italy, 1709. He was descended from a noble
family, and celebrated for his great classical learning,
and for his extensive acquaintance with the mathematical
sciences. He was patronized by Francis Moria, duke of Urbino,
and by his liberality enabled to publish translations of
various parts of the works of Archimedes: the Conics of
Apollonius; the Elements of Euclid, and many other
works of high reputation. He was also author of a book
titled "De Cento Gravissim Solidauro." Bologna,
1565; and of another entitled, "Horologiorum Descriptio"
Rome, 1562. He died in 1575; a funeral oration was

COMMANDMENT, in a Legal Sense, has various
uses as, Commandment of the king, when on his own mere
motion, and from his own mouth, he calls a man into prifon.

Commandment of the justices, is either absolute or ordinary;
absolute, as when, on their own authority, and their own
discretion, they commit a man for contempt, &c. to prifon,
as a punishment. Ordinary, as when they commit him
rather for fact custody, than punishment.—A man committed
by an ordinary commandment is releivable. Persons
committed to prifon by the special command of the king
were not formerly bailable by the court of king's bench;
but at this day, the law is otherwise. 2. Hawk. P. C.
c. 15, § 36.

COMMANDMENT, is also used for the offence of him who
directs or wills another to transgress the law; as by murder,
thief, and the like. See Accessory.

H. that commandeth any one to do an unlawful act, is
accursory to it and all the consequences, if it be executed
in the same manner as commanded: but if the command
revoke the command; or if the execution varies from it, or
in the nature of the offence; in such case he will not be
accursory. 3 Infl. 51, 57, 2 Infl. 132.

In another sense of this word, magistrates may command
others to afflict them in the execution of their offices, for the
doing of justice; and so may a judge of peace, to suppress
riots, apprehend felons; or any officer to keep the king's
peace, &c. Bro. 3.

A master may command his servant to drive another
man's cattle out of his ground, to enter into lands, to
seize goods, to disturb for rent, or to do other things;
if the thing be not a trepsa to others. The command-
ment of a thing is good; where he that commands hath
power to do it; and a verbal command is in most cafes
sufficient; unless he be, where it is given by a corporation,
or when a sheriff's warrant is to a bailiff to arrest, &c.

In trepsa, &c. the master shall be accountable for the
act of the servant done by his command; but servants shall
not be excused for committing any crime, when they act
by command of their master, who have no authority to
give such commands. The commands of infants and feme
coverts are void; but in forcible entries, &c. an infant or
feme covert may be guilty in respect of actual violence done
by them in person.

COMMANDMENTS, Ten. See Decalogue.

COMMANDRY, or Commandery, a kind of benefice.
or fixed revenue belonging to a military order, and conferred on ancient knights, who had done considerable service to the order.

There are *field* or *regular* commanderies, obtained in order, and by merit: there are others of *grace or favour*, conferred at the pleasure of the grand master.

There are also commanderies for the religious in the orders of St. Bernard and St. Anthony.—The kings of France have converted several of the hospitals or lepers into commanderies of the order of St. Lazarus.

The commanderies of Malta are of different kinds; for as the order consists of knights, chaplains, and brother ferritors, there are peculiar commanderies, or revenues, attached to each.

The knight to whom one of these benefices or commanderies is given, is called commander; which agrees pretty nearly with the *præfectus fecer* over the monks in places at a distance from the monastery, whose administration was called *decemviri* because depending entirely on the abbot who gave him his commissiou. Thus it is with the simple commanders of Malta, who are rather farmers of the order than benefices; paying a certain tribute, or rent, called *rentesfeo*, to the common treasury of the order.

The commanderies belonging to the priory of St. John of Jerusalem in England, confining of monasteries, lands, &c., such was that of New Eagle in Lincolnshire, Selbich in Pembrokeshire, and Shengay in Cambridgeshire, were given to Henry VIII. by statute 52 Hen. VIII. c. 20; so that the name of commanderies only remains, the power being long since extinct.

**COMMANNI.** In *Geography*. See **COMENDO**.

**COMMIPULARIS.** In *Ancient Military Language*, a Roman folder, who could not ride but with his own centur, nor fight but under its standard.

**COMMANDOES.** In *Geography*, one of the small Virgin isles in the West Indies, situated to the N.E. of Tortola. N. lat. 19° 25'. W. long. 65°.

**COMMONTAWANA**, a bay on the north coast of the island of St. Vincent, about one mile east of Tarraty point.

**COMMARCHIO, in *Antiquity*, the confines of the land, whence probably is derived the word марчер. "Impranii de nonibus landiumci," *Du-Cange*. **COMMARODES, in Ancient Geography*, a place of Thrace, in the vicinity of Constanitнопол.

**COMMEATUS, in Military Language*, a passport or permission granted to a Roman soldier to absent himself from the army for a fixed or limited time. The same name was also given to soldiers' provisions and their efforts.

**COMMELENIA, in Botany**, *commenis*, Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Ency. 398. Ill. Wild. 1. Dill. Ethb. tab. 78. Sp. Gart. tab. 15. fig. 1. Lam. Ill. tab. 35. fig. 1. Koofeici. Kempi Jap. 288. t-ab. 389. 3. *C. polgaena*, Roth. Catlelet. Bot. 1. p. 1. "Leaves ovate-lanceolate, acute, *fem*m creeping, fmoth." *Reed annual*. *Stems* several, two feet long, jointed, branched, leafy. *Leaves* alternate, nervd, supported by a membranous sheath with short hairs at its edge. *Flowers* axillary, two or three together, on short peduncles; two of the petals blue, the third white. *Capsule* egg-shaped, slightly compressed on each side, somewhat two-edged, two-celled, two-valved; valves thin, membranous, with the longitudinal partition on their inner side. *Stems* two in each cell, adhered to the valves near the infirnation of the partition, two adhering to each valve, gibbous and pitted on one side, flat and furrowed, with a longitudinal line on the other, truncate at the end where they are opposite to each other, umbilicated. A native of North America, Africa, and Japan. *ß* differs only in having polygamous diandrous flowers. In all other respects it exactly corresponds with *C. communis*, of which it appears to be only a variety. Wild. 2. *C. africana*. Linn. Sp. Pl. 2. Mart. 2. Lam. 1. Ency. 398. Ill. Wild. 2. Gart. tab. 15. fig. 3. Lam. Ill. tab. 35. fig. 3. "Leaves lanceolate, smooth; *fem*m deciduous." *Root* perennial. *Stems* about a foot long, branched, smooth. *Leaves* narrower, with ciliated or bearded sheaths, and a smaller one within the other. *Flowers* with two petals; yellow, unciated and roundish, or kidney shaped; the third small, oval, soft, and attention. He completed the work begun by his uncle, which he published in 1701. His next production was "Flora Malabarica, seu Horti Malabarici Catalogus," serving as an index to the Hortus Malabaricus. This was followed by "Prauludia Anatomica," 410. 1703; and the same year, "Prauludia Botanica," with figures for the benefit of students in those arts. In 1715, he published, "Icones Plantarum, pretierim ex Indiis Collectarum," 410; and, in 1718, "Botanographia Malabarica, a NOMI- num Barbarismis reviltuta," Lugduni Bat. folio. All useful to students in botany, but serving rather to flay the great industry, than the genius of the writer. Haller. Bib. Botan. Elyx. Dcl. Hilt.


Obscr. Linnaceus considers the spathae as the only calyx, and attributes six petals to the flower; three small, femelab, remaining small, and three interior, very large, coloured.

* Two petals larger; one small.

Sp. 1. C. communis. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Ency. 398. Ill. Wild. 1. Dill. Ethb. tab. 78. Sp. Gart. tab. 15. fig. 1. Lam. Ill. tab. 35. fig. 1. Koolecici. Kempi Jap. 288. t-ab. 389. 3. *C. polgaena*, Roth. Catlelet. Bot. 1. p. 1. "Leaves ovate-lanceolate, acute, *fem*m creeping, *fmoth*." *Reed annual*. *Stems* several, two feet long, jointed, branched, leafy. *Leaves* alternate, nervd, supported by a membranous sheath with short hairs at its edge. *Flowers* axillary, two or three together, on short peduncles; two of the petals blue, the third white. *Capsule* egg-shaped, slightly compressed on each side, somewhat two-edged, two-celled, two-valved; valves thin, membranous, with the longitudinal partition on their inner side. *Stems* two in each cell, adhered to the valves near the infirnation of the partition, two adhering to each valve, gibbous and pitted on one side, flat and furrowed, with a longitudinal line on the other, truncate at the end where they are opposite to each other, umbilicated. A native of North America, Africa, and Japan. *ß* differs only in having polygamous diandrous flowers. In all other respects it exactly corresponds with *C. communis*, of which it appears to be only a variety. Wild. 2. *C. africana*. Linn. Sp. Pl. 2. Mart. 2. Lam. 1. Ency. 398. Ill. Wild. 2. Gartt. tab. 15. fig. 3. Lam. Ill. tab. 35. fig. 3. "Leaves lanceolate, smooth; *fem*m deciduous." *Root* perennial. *Stems* about a foot long, branched, smooth. *Leaves* narrower, with ciliated or bearded sheaths, and a smaller one within the other. *Flowers* with two petals; yellow, unciuated and roundish, or kidney shaped; the third small, oval, soft, and...

**Petals nearly equal.**

hairy; flowers panicled.” Stem a foot high, furrowed, paneled at the top. Leaves alternate, flattening, acute, smooth; lower ones three inches long; upper ones about an inch. A native of Japan. 17. C. spirata. Linn. Mant. II. 1:6 Hort. Kew. 77. (C. bracteolata; Lam.) “Leaves lanceolate; flowers panicled.” Linn. Leaves lanceolate-linear, undulated. somewhat curled; peduncles panicled, furnished with small bractes, half-embracing the stem. Linn. Root annual. Stem stem, ascending, somewhat scabrous; Linn. Stem six or seven inches long, very slender, bent at the joints, almost smooth, leafy, branched; Linn. Laves lanceolate, flatting, very minutely ferrated; upper leaf cordate-lanceolate; sheaths ciliated at the edge. Linn. Leaves narrow; sheaths short, ciliated; Linn. Flowers small, blueish; Lam. Peduncle terminal, divaricated, with small flatting bractes; Linn. Lam. Peduncles capillary, compound; Lam. Calyx three-leafed; leaves ovate-lanceolate, concave; Lam. Petals three, equal, orbicular-egg-shaped; Linn. Petals three, egg shaped, a little longer than the calyx. Linn. Filaments of the filaments three, bearded, naked above the middle. Linn. Almost entirely naked. Lam. Filaments of the villosa three, somewhat ciliated at the sides. Corpuscles crenatum, g lobular in the tips, whitish; Linn. corpuscles yellow: Lam. Style and stigma spirally convoluted, and evolved variously; Linn. Style permanent, a little spirally twisted when the flower is past; Linn. Found by Koenig in moist ground, by the side of rivulets in the East Indies; communicated to La Marek from the East Indies by Sonnerat. La Marek seems to have no good reason to doubt the identity of his plant with that of Linnaeus.

Ost. It is evident from the above descriptions, that this genus, as it now stands, is a very anomalous one. C. alexandra, if it had needeed filaments, would unquestionably be a tradescantia. C. vaginata, nudiflora, and spirata, approach to this genus, by their partially bearded filaments, but differ in the number of filaments; the third two have the additional anomaly of being chandraous, without a correponding diminution in the number of the other parts. Lam. The species in his second Mantissa, seems to have forgotten, or to have discarded, his original idea with respect to the flower; for he attributes to it, not a five petalled corolla, but a three-petalled one, with a proper three-leaved calyx. Gartner is of opinion that commelinia and tradescantia are one truly natural genus.

COMMELINA axillaris et triflata. Linn. See Tradescantia.

Propogation and Culture. All the species are propagated by seed. If the seeds of C. communis, which is an annual, be sown upon a warm border of light earth in the autumn, they will come up early in the spring and ripen their fruit. The roots of C. africana send out offsets, by which the plant is easily propagated; but they will seldom live through the winter in the open air. The other species are tender, and must be sown in a moderate hot bed in the spring; transplanted to a fresh hot-bed, when they are two inches high; and in June, again transplanted into a warm border of light earth. C. tuberosa may be preferred; it planted in pots, and placed in the bank-love in autumn; or its roots may be taken out of the ground in the autumn, kept in a warm place during the winter, and planted again in the spring; they will then more forward and stronger if placed on a hotbed.

COMMENORATION, the remembrance of any one; or something done in honour of a person's memory.

Among the Romanists, it is a practice for dying person
the introduction to the printed narrative, dedicated by permission to the king, is the following.

"It was in the year 1783, that the idea of this great enterprise was conceived in a conversation between Lord Fitzwilliam, the late Sir Watkin Williams, and Josiah Daines, late commissioner of the victualling office, on observing how much more London abounded with great musicians, vocal and instrumental, foreigners and natives, than any other city in Europe: but so disparaged and despised at the opereos, oratories, theatres, and public and private concerts, that they can never be heard in the aggregate, nor can the effects which may be produced by such a united band as our capital could furnish, ever be known, unless some plan was formed of a public periodical occasion for collecting and confounding them into one band; by which means a performance might be exhibited on so grand and magnificent a scale as no other part of the world could equal. The birth and death of Handel naturally occurred to three such enthusiastic admirers of that great master, and it was immediately recollected, that the next (now the present) year, would be a proper time for the introduction of such a custom: as it formed a complete century since his birth, and an exact quarter of a century since his decease.

The plan was soon after communicated to the governors of the Musical Fund, who approved it, and promised their assistance. It was next submitted to the directors of the concert of Ancient Music, who, with an alacrity which does honour to their zeal for the memory of the great artist Handel, voluntarily undertook the trouble of managing and directing the celebrity. At length, the design coming to the knowledge of the king, it was honoured with his majesty's sanction and patronage. Westminster Abbey, where the bones of the great musician were deposited, was thought the proper place for the performance; and application having been made to the bishop of Rochester for the use of it, his lordship, finding that the scheme was honoured with the patronage of his majesty, readily consented; only requiring, as the performance would interfere with the annual benefit for the Westminster Infirmary, that part of the profits might be appropriated to that charity as an indemnification for the loss it would sustain.

To this the projectors of the plan acceded; and it was afterwards settled, that the profits of the first day's performance should be equally divided between the musical fund and the Westminster Infirmary; and those of the subsequent days be solely applied to the use of that fund which Handel himself so long helped to sustain, and to which he not only bequeathed a 1000l., but which almost every musician in the capital annually contributes his money, his performance, or both, to support.

Imperfect with a reverence for the memory of Handel, no sooner was the project known, but most of the practical musicians in the kingdom eagerly manifested their zeal for the enterprise; and many of the most eminent professed, waving all claims to precedence in the band, offered to perform in any subordinate station, in which their talents could be most useful.

"By the latter end of February, the plan and necessary arrangement were so far digested and advanced, that the directors ventured to infuse in all the newspapers, the following advertisement.

Under the Patronage of His Majesty,
In Commemoration of Handel, who was buried in Westminster Abbey, on the 21st of April, 1759.

On Wednesday the 21st of April next, will be performed in Westminster Abbey, under the management of the Earl of Exeter
Earl of Sandwich
Viscount Dudley Ward
Viscount Fitzwilliam
Right Hon. H. Morrice
Sir W. Williams Wynn, Bart.
Sir Richard Jebb, Bart.

Directors of the concert of Ancient Music;

Some of the most approved pieces of sacred music, of that great composer.
The doors will be opened at 9 o'clock, and the performance will begin precisely at twelve.

And on the evening of the same day, will be performed, at the Pantheon, a grand miscellaneous concert of vocal and instrumental music; consisting entirely of pieces selected from the works of Handel.
The doors will be opened at 6 o'clock, and the concert will begin exactly at eight.

And on Saturday morning, April 24th, will be performed, in Westminster Abbey, the sacred oratorio of the Messiah.

Such is the reverence for this illustrious master, that most of the performers in London, and a great many from different parts of the kingdom, have generously offered their assistance; and the orchestra will consist of at least 400 performers, a more numerous band than was ever known to be collected in any country, or on any occasion whatever. The profits arising from the performances, will be applied to charitable purposes.

In order to render the band as powerful and complete as possible, the trombone, fagott, or double corde, and double kettle drums, were sought and their name revived.

In preparing Westminster Abbey for the reception of their majesties and the royal family, as well as the archbishops and bishops, judges, great officers of state, and principal nobility and gentry in the kingdom, to the amount of three or four thousand, Mr. James Wyatt, the admirable architect of the ill-fated Pantheon, furnished the elegant drawings for the orchestra, throne, and galleries.

As this commemoration is not only the first instance of a band of such magnitude being assembled together, but of any band, at all numerous, performing in a similar situation, without the assistance of a manufactory, to regulate the measure, the performances in Westminster Abbey may be safely pronounced, no less remarkable for the multiplicity of voices and instruments employed, than for accuracy and precision. When all the wheels of that huge machine, the orchestra, were in motion, the effect resembled clock-work in every thing, but want of feeling and expression.

And, as the power of gravity and attraction in bodies are proportioned to their mass and density, so it seems as if the magnitude of this band had commanded and impelled adhesion and obedience, beyond that of any other of inferior force. The pulsations in every limb, and ramifications of veins and arteries in an animal, could not be more reciprocal, simultaneous, and under the regulation of the heart, than the members of this body of musicians under that of the conductor and leader. The totality of sound seemed to proceed from one voice, and one instrument; and the powers produced, not only new and exquisite sensations in judges, and lovers of the art, but were felt by those who never received pleasure from music before.

This celebration was at first designed to be extended to no more than two performances on the same day; one at noon in Westminster Abbey, for sacred music; and the other in the evening of the same day at the Pantheon, for secular compositions, selected from the operas and miscellaneous works of the hero whose apotheosis was the efficient cause of this extraordinary undertaking. But being counseled by his majesty, the directors of the concert of ancient music,
the governors of the musical fund, and eagerly recognized by the public in general, while the plan was digressing, it determined the projectors, at the instigation of his majesty, to have three performances. The first and third in the morning, at Westminster Abbey, and the second at the Pantheon.

These performances having given such entire satisfaction to all that were present, and becoming, of course, the general subject of discussion and praise, excited a great desire in all lovers of music, and even of splendid spectacles, who were absent, to be enabled to judge and speak of transactions so memorable, from the conviction of their own senses. But even these were not more eager in wishing there might be a repetition of the performances, than those who had already attended them. Luckily for all parties, the wishes of their majesties coincided with those of their subjects; and as the seafaring was still standing, and the band not yet dispersed, two more opportunities were given for the display of Handel's wonderful powers, and the gratification of public curiosity.

The fourth day was supplied with a well chosen selection of Handel's most grand and captivating compositions, from his oratorios and anthems; and on the fifth, that sublime production, the Messiah, was repeated; and though it had been performed in the Abbey but a week before, in so perfect and magnificent a manner, that no rehearsal, previous to its repetition, was necessary to the band; yet, to gratify the wishes of many timid and infirm lovers of music, who dreaded the crowd that was likely to be assembled at a public performance, as well as to raise money for charitable purposes, another rehearsal would certainly have been announced, if it had not been prevented from taking place by the celebration of his majesty's birth day, on which occasion there was a certainty that the chief part of the performers and company would be engaged.

Those who attended this day's commemoration at the Abbey were, seemingly, of a higher class than had yet appeared there; so that though the crowd was somewhat less than at the preceding performance of the same oratorio, the exhibition was more splendid. Indeed, as a spectacle, it was so magnificent to the sight, and, as a musical performance, so melifluous and grateful to the ear, that it will be difficult for the mind's eye of those who were absent, to form an adequate idea of the show, or the mental ear of the found, from description. Every one present must have found full employment for the two senses which afford us the most refined pleasure; as it is from the eye and the ear that intellect is fed, and the mind furnished with its best intelligence.

At the first performance of the Messiah, his majesty expressed a desire to the earl of Sandwich of hearing the most truly sublime of all oratorics, "Alleluia! for the Lord God omnipotent reigneth," a second time; and this graciously was conveyed to the orchestra, by the waving of his lordship's wand. At this second performance of that matchless oratorio, his majesty was pleased to make the signal himself, with a gentle motion of his right hand, in which was the printed book of the words, not only for the repetition of this, but of the final chorus, in the last part, to the great gratification of all his happy subjects present; and, perhaps, the subjects of no sovereign prince on the globe were ever before so delighted with the effects of a royal mandate.

Thus ended the fifth and last of the performances for this memorable celebration; and so great and perfect was the pleasure which the audience had received, that those who had attended all the five exhibitions seemed most to regret this final close.

The whole receipts at the five performances of this most splendid and magnificent celebration amounted to £1,378 12s. 10d. Of which, after all disbursements for building, band, and other incidental expenses, to the amount of 57 12s. 10d. 6000l. remained for the fund of the society of decayed musicians, and 1000l. for the Westminster hospital.

At the end of the printed account of the first year's Commemoration of Handel, is added in the Appendix, a "History of the Rise and Progress of the Fund for the Support of decayed Musicians and their Families, established in 1786," which has been since landedly imitated by other professions, and in other countries; and it appeared in 1784, after these performances, that by the great accession to the fund from the commemoration, its capital became a serious and weighty concern, amounting to upwards of 22,000l., in South-sea annuities and three per cent.; which realizes and ascertains an income of 675l. a year, exclusive of benefits or subcription.

The path therefore which the governors and court of affidants have now to pursue, is perfectly plain and pleasant; the power of alleviating distresses and misery, of feeding the hungry, clothing the naked, and administering comfort to age and infirmities, is placed in their hands, without the trouble of providing the means.

COMMEMORATION, in Ancient Geography, a river of Asia, according to Arrian, who says that it ran into the Indus.

COMMENDAM, in the Canon Law, the charge, trust, and administration of the revenues of a benefice, given to a layman to enjoy, by way of dotation, for the space of six months, in order to its being repaired, &c. or to another bishop, or ecclesiastic, to perform the pastoral offices thereof, till such time as the benefice is provided of a regular incumbent. See Benefice.

Anciently, the administration of vacant bishoprics belonged to the nearest neighbouring bishop; which continued to be practised between the archbishopric of Lyons, and the bishopric of Autun: on this account they were called commendation bishopps.

This custom appears to be very ancient: St. Athanasius says of himself, according to Nicephorus, that there had been given him in commendam, i.e. in administration, another church besides that of Alexandria, whereas he was flated bishop.

The care of churches, it seems, which had no pastor, was committed to a bishop, till they were provided with an ordinary: the rector of pope Gregory I. is full of these commissions, or commendam, granted during the absence or sickness of a bishop, or the vacancy of a see. Some say, that pope Leo IV. first set the modern commendams on foot, in favour of ecclesiastics who had been expelled their benefices by the Saracens; to whom the administration of the vacant churches was committed for a time, in expectation of their being restored: though St. Gregory is said also to have used the same, while the Lombards defolated Italy.

In a little time, the practice of commendams became exceedingly abused: and the revenues of monasteries were given to laymen for their subsistence. The bishops also procured several benefices, or even bishoprics, in commendam, which served for a pretext for holding them all without directly violating the canons. Part of the abuse has been repressed; but the use of commendams is still retained, as an expedient to take off the incompatibility of the person, by the nature of the benefice.

When
When a parson is made bishop, his parsonage becomes vacant; but if the king by special dispensation give him power to retain his benefice, notwithstanding his promotion, he shall continue parson, and is said to hold it in commendam; but this must be done before consecration, for afterwards it comes too late. Because the benefice is then absolutely void. There are several forts of commendations founded on the flat.

25 Hen. VIII. cap. 21. as a commendam sempiterna, which is for the benefit of the church, without any regard to the commendatory, being only a provisional act of the ordinary, for supplying the vacation of 6 months, in which time the patron is to present his clerk, and only implies a quoad maxima of the cure and fruits till the clerk is presented: commendam retinere, by means of which a bishop retains benefices on his preeminent, which has operated for a certain number of years or even as long as the commendatory lived, and continued bishop; and these commendations are granted on the king's mandate to the archbishop, expressing his consent, which continues the incumbency, so that there is no occasion for institution: a commendam recipere, which is to take a benefice de novo. in the bishop's own gift, or of some other patron, whose consent is obtained; and for life, when it is equal to a presentation, without institution, or induction. But all dispensations beyond 6 months were only permis in at first; and granted to persons of merit; the commendam retinere is for one or two years, &c. and sometimes for three or six years, and doth not alter the clait which the incumbent had before; and this, as long as the commendatory should live and continue bishop, hath been thought good. Vaugh. 18.

The commendam recipere must be for life, as other patron's and vicars enjoy their benefices: and as a patron cannot present to a full church, so neither can a commendam recipere be made to a church that is then full. Show. 414.

A benefice cannot be commended by parts, any more than it may be presented unto by parts; so that one shall have the glebe, another the tythes, &c. Nor can a commendatory have a juris urum, or take to him and his Successors, free or be freed, in a writ of annuity, &c. But a commendam perpetua may be admitted to do it. 11 Hen. IV. Compl. Incumb. 360. (See Nell. Abr. 454.)

These commendations are now in fact seldom or never granted to any but bishops; and in that case the bishop is made commendatory of the benefice while he continues bishop of such a diocese, as the object is to make an addition to a small bishopric; and it would be unreasonabable to grant it to a bishop for life, who might afterwards be translated to one of the vacant sees.

Commendam, in populi countries, is a real title of a regular benefice; as an abbey, or priory given by the pope to a secular cleric, or even to a layman, with power to dispose of the fruits thereof during his life.

No benefice that has a cure of souls, i.e. no parsonage, or bishopric, can be given in commendam. This practice being entirely contrary to the canons, none but the pope, who has a power of dispensing with the canons, can confer it.

When the commendam becomes vacant by the death of the commendatory, it is not deemed vacant by his death; but as it was before the commendam was granted: that making no alteration in the thing: yet the pope gives the same benefice in commendam again, by a privilege which he still continues.

By the pope's bulls, a commendatory abbots has the full authority of the regular abbots to whom he is sublubilated. For this reason, the bulls expressly require, that he be a priest; or, if he have not yet attained the age of priest-
Little Commento; the Dutch distinguish both by the name of Great and Little Commento. This kingdom produces but little rice; nevertheless, the values are no lef: fertile than agreeable, and the hills covered with wood, which affords a very delightful prospect. Behind Little Commento, the land rises by a gentle ascent into little hills, beautifully sheltered with woods of a perpetual verdure; and at the bottom are meadows and plains diversified with various kinds of fruit-trees. The natives are warfare, and so numerous, that in this little kingdom, the sovereign is able to raise an army of 25,000 men. His ordinary body-guard is composed of 500 stout fellows, well armed, redoubt, and loyal. It has been said that Commento abounds in gold mines, but that the king, for fear of exciting the avarice of the Europeans, prohibits the working of them. This country is divided into two distinct provinces. We shall content ourselves with describing Little Commento. This province is called by the Portuguese Aldea das Terras, and by the natives Ikkia Tekki. The town is said to contain at least 100 houses. It is situated on the banks of a fine rivulet, that empties itself into the sea on the southward, which forms a kind of canal, or little oblong harbour for canoes. The N.E. side of the town, where the French had formerly a settlement, is bordered by little hills, at the foot of which lie rich meadows and pastures, as well as fertile fields, every where interfered with groves of fruit-trees. Little Commento, which was once a place of great note, and one of the finest towns in Guinea, has since exhibited only the remains of a town destroyed by fire, and the well-peopled ruins of a once flourishing and great city. The natives of Little Commento are in general turbulent, cunning, and deceitful; much addicted to lying and cheating. Their employment consists either in fishing or in commerce, and their neighbours employ them as brokers and factors, particularly the people of Akamen, who carry on a considerable trade. Every morning 70 or 80 large canoes may be seen upon the coast fishing, or trading with the European shipping in the road. About the middle of the day they put to shore when the south-west winds begin to blow, both for facility of unloading, and for securing a market for their cargoes, either at Great or Little Commento, where the inland negroes affemble with the commodities of their principal countries. No markets on earth are better furnished with all sorts of grain, roots, fruits, olive, and fish, than these, nor at a more reasonable price. Here the English and Dutch have factories. Next to Cape Coast, the English fort is said to be the principal which they possess in Guinea, at least on the Gold Coast. The Dutch fort of Wodenburg, lies at the distance of a musket shot, and was built in the year 1688. N. lat. 4° 34'. E. long. 2° 34'.

The principal commodities for which there is a demand by the negroes of Commento, are ghosts beads, brass bells, and buttons, long linen cloths and woollen stuffs. They are very dextrous in the adulteration of gold, and the practice is very common. When the people of Commento are at war, they have usually a slave-market at Little Commento, for the more quick dispatch of their bufiness. Here also they keep quantities of gold in the hands of certain agents employed to carry on trade, while the rest are fighting the enemy in the field. The gold trade, however, is not very considerable.

COMMENDONE. GIANN Francesco, in Biographia, an eminent prelate in the church of Rome, was born at Venice in 1524, and began, at the early age of ten years, to compose verses. He pursued his studies at Padua, and in the year 1530, he was introduced to pope Julius III., by whom he was made chamberlain, and afterwards employed on public business. In 1553, he accompanied the legate cardinal Bardin to Flanders, and from thence he was dispatched secretly to England, to inquire into the state of religion under queen Mary. Paul IV., made him bishop of Zart, and commissioned him to excite the different states of Italy to unite with him in a common league. By Pius IV., he was raised to the office of cardinal in 1562, while he was nuncio in Poland. He was employed in various other missions to foreign states, and in all these he acted with zeal for his church, and executed whatever was committed to his charge with the utmost dispatch and fidelity. Under Gregory XIII., he was prosecuted by the imperial faction for having too great a partiality towards France; his own party was, however, so strong, that he was not only acquitted, but upon a dangerous illness of the pope, it was projected to raise him to the papal crown. The pope, by recovering his health, disappointed his expectations, and Commentone himself died at Padua, in December, 1564. He is not celebrated as an author, having left behind him only some Latin poems, among those of the Academy of Occulti, of which he was the zealous patron, and some letters inserted in the notes to those of Giulio Poggiarino. Commentone was reckoned one of the ablest politicians of his own time, a man of great learning, and a friend to literature. He cultivated an intimate friendship with many of the most eminent scholars in Italy, and to him were addressed some letters of Annibale Caro. Gen. Biog.

COMMENSURABLE Quantities, in Geometry, are such as have some common aliquot part, or which may be measured or divided without leaving a remainder, by some measure or divisor, called their common measure. Thus, a foot and a yard are commensurable; there being a third quantity which will measure each, viz. an inch; which taken 12 times makes a foot, and 36 times a yard.

Commensurables are to each other as one rational whole number to another. In incommensurables it is otherwise. The ratio of commensurables, therefore, is rational; that of incommensurables irrational: hence, also, the exponent of the ratio of commensurables is a rational number.

COMMENSURABLE Numbers, in Arithmetic, whether integers or fractions, are such as have some other number which will measure or divide them without any remainder. Thus, 6 and 8, both divided by 2, are respectively commensurable numbers; and 6 and 8, 2 and 4, and 3 and 6, are commensurable fractions, because the fraction 3/6 or 2/4 will measure them both; and in this sense all fractions may be said to be commensurable.

COMMENSURABLE in Power. Right lines are said to be commensurable in power, when their squares are measured by one and the same space, or superficies.

COMMENSURABLE Surds, are such surds as, being reduced to their least terms, become true figurative quantities of their kind; and are therefore as a rational quantity to a rational: such are 3√2 and 2√3 being one to the other as 3 to 2. See Surd.

COMMENTACULA, among the Romans, therof the flamens carried in their hands when going to sacrifice.

COMMENTARIENSIS, in Ancient Military Language, the person who was gazer of the soldiers' prison among the Romans, and kept its regifiers. He was subject to the "triumpvri capitales".

COMMENTARY, or Comment, a gloss, or interpretation, affixed to some ancient, obscure, or difficult author, to render him more intelligible, or to supply what he has left undone. The biblical student may find some judicious and useful remarks on commentaries, or those who have written commentaries on the Sacred Scripture, in Mr. Locke's Pre-
C O M M E R C E.

The situation and circumstances of the Phoenicians naturally led them to look to commerce as the only source from which they could derive opulence or power; and accordingly, the foreign trade carried on by them, particularly from Sidon and Tyre, became more extensive and important than that of any state in the ancient world. Their ships not only frequented all the ports in the Mediterranean, but they were the first who ventured beyond the ancient boundaries of navigation, and passing the straits of Gibraltar, visited the western coasts of Spain and Africa. They revived a commercial intercourse with Arabia and the continent of India, on the one hand, and with the eastern coast of Africa on the other; the cargoes which they purchased in Arabia, Ethiopia, and India, being landed at Elath, the safest harbour in the Red Sea towards the north; thence they were carried by land to Rhinocolura, the distance not being very considerable, and, being re-shipped in that port, were transported to Tyre, and distributed over the world.

The wealth which the Phoenicians acquired by monopolizing the commerce of the Red Sea, invited their neighbours, the Jews, under the prosperous reigns of David and Solomon, to aim at being admitted to some share of it. Solomon fitted out fleets, which, navigated by Phenician pilots and mariners, sailed from the Red Sea to Tarshish and Ophir, from whence they brought back valuable cargoes as suddenly diffused wealth and splendour through the kingdom of Israel. But the inquisitions of the Jews were by no means favourable to commerce, which was never carried to any great extent by them while they inhabited Judea.

The Carthaginians applied themselves to commerce and navigation with ardour, ingenuity, and success; but as the Phoenicians had encroached the commerce of India, their adventures were chiefly made to the west and north. Following the course which the Phoenicians had opened, they extended their voyages beyond the shores of the Mediterranean, visiting not only all the coasts of Spain, but those of Gaul, and penetrating at last to Britain. They made voyages of discovery in different directions, and thus established a commercial intercourse with places which before were wholly unknown; but whatever knowledge of this kind they acquired, it was concealed from the inhabitants of other states with the utmost care.

The Greeks, although their country was almost encompassed by the sea, which formed many fricas bays and commodious harbours, and though it was surrounded by a number of fertile islands, were notwithstanding such a favourable situation, a long time before they attained any degree of perfection in navigation. They fearfully carried on any commerce beyond the limits of the Mediterranean. Their chief intercourse was with the colonies of their countrymen planted in the island Aila, in Italy, and in Sicily. They sometimes visited the ports of Egypt, of the southern provinces of Gaul, and of Thrace, or passing through the Hellespont, they traded with the countries situated around the Euxine sea. The expedition of Alexander into the east considerably enlarged the geographical knowledge of the Greeks. He had observed the resources which commerce creates, in the exertions of the republic of Tyre, and therefore it became part of his plan to render the empire which he proposed to establish, the centre of commerce as well as the seat of dominion. With this view, he founded Alexandria near one of the mouths of the Nile, that by the Mediterranean sea, and the neighbourhood of the Arabian gulf, it might command the trade both of the east and west. This situation was so judiciously chosen, that Alexandria soon became the chief commercial city in the world. Not only during the subsistence of the Grecian empire in Egypt and
in the east, but amid all the succeeding revolutions of those countries, commerce, particularly that of the East Indies, continued to flow in the channel which the facility and foresight of Alexander had marked out for it, till the discovery of the navigation by the Cape of Good Hope opened a more expeditious and independent channel to all the maritime states of Europe.

In the early periods of the Roman history, commerce appears to have been much neglected and undervalued; it seems to have been thought a degrading employ by this military people, and to have been left almost entirely in the hands of the natives of the countries they conquered. The extent, however, of the Roman power, which included the greatest part of the known world, the vigilant inspection of the Roman magistrates, and the spirit of the Roman government, no less intelligent than active, gave such additional security to commerce, as animated it with new vigour; and, as soon as the Romans acquired a taste for the productions of other countries, commerce, particularly the trade with India through Egypt, was pushed with new vigour, and carried on to a greater extent. The pilots who failed from Egypt to India first ventured to quit the shores of the sea, and depending wholly on the trade winds, boldly sailed from Ocelet at the mouth of the Arabian gulph, across the ocean, to the coast of Malabar, returning with the eastern monsoon, and thus procuring the spices and other rich commodities of the continent and islands of the farther India, which were brought to the port of Memfis by the Indians themselves.

The commerce thus carried on will appear considerable even in the present age, as the trade with India is said to have drained the Roman empire every year of more than four hundred thousand pounds, and that one hundred and twenty ships sailed annually from the Arabian gulph to that country. The reign of Augustus was very favourable to commerce, as the peace which then prevailed over the civilized parts of the world, enabled the merchants to pursue it unmolested. Under Tiberius we find the Romans extending their protection to the north, and the town of Haven, the most ancient in Frieland, founded. Under Nero, the capital of England is first mentioned as a considerable place.

Tacitus, who lived for some time at London, says it was famous for its many merchants, and plenty of its merchants. Rome, however, as the seat of wealth and luxury, continued to be the metropolis of the commercial world, until the fourth century, when Constantinople removed the seat of empire to Constantinople, and made it the emporium of commerce. This city was undoubtedly well adapted for that honour; it was favoured by nature with a fine climate, and in a most advantageous situation for carrying on an extensive correspondence with every part of the world then known.

The invasion by the northern nations in the fifth century, not merely arrested the progress of commerce, but effectually dissolved all commercial connections, and deprived the merchants of any market for their commodities. Europe became parcelled out into many small and independent states, differing from each other in language and customs; no intercourse subsisted between the members of those divided and hostile communities; their mode of life was simple, they had few wants to supply, and few superfluities to dabble of. Cities, in which alone an extensive commerce can be carried on, were few, incommodious, and destitute of those commodities which produce security or excite enterprise. It became disagreeable and dangerous to visit any foreign country, and thus the knowledge of remote regions was lost; their situation, their commodities, and almost their names, were unknown. The preservation of Constantinople from the general destruction, however, prevented commercial intercourse with distant nations from ceasing altogether. In that city the knowledge of ancient arts and discoveries was preserved; a taste for splendour and elegance subsisted; the productions of foreign countries were in request; and commerce continued to flourish there, when it was almost extinct in every other part of Europe. The merchants of Constantinople did not confine their trade to the islands of the Archipelago, or to the adjacent coasts of Asia; they took a wider range, and following the course which the ancients had marked out, imported the commodities of the East Indies from Alexandria. When Egypt was torn from the Roman empire by the Arabsians, the industry of the Greeks discovered a new channel, by which the productions of India might be conveyed to Constantinople. They were carried up the Indus, as far as that great river is navigable; thence they were transported by land to the banks of the river Oxus, and proceeded down its stream to the Caspian sea. There they entered the Volga, and falling up it, were carried by land to the Tanais, which conducted them into the Euxine sea, where vessels from Constantinople waited their arrival. This extraordinary and tedious mode of conveyance, Dr. Robertson observes, is a proof not only of the violent passion which the inhabitants of Constantinople had conceived for the luxuries of the east, and of the ardour and ingenuity with which they carried on commerce, but it demonstrates, that during the ignorance which reigned in the rest of Europe, a knowledge of remote countries was still preserved in the capital of the Greek empire. Robertson's Hist. Amer. vol. i.

The devastations of the Huns in Italy induced many of the richest inhabitants of the country near the bottom of the Adriatic, to fly with their belt effects into the numerous small sandy isles lying amongst the shallow waters near the shores of the continent; on which isles, about seventy-two in number, they built such habitations as their circumstances would admit; and here by degrees arose the celebrated commercial city of Venice. Necessity first obliged them to devote themselves to commerce, the earliest branch of which was naturally the fisheries. Their next commercial object was the manufacture and exportation of salt. Thus by the application of its inhabitants, and the security of its situation, Venice gradually became the general magazine for the merchandise of the neighbouring continent, to which the many rivers that fall into the Adriatic sea greatly contributed; and as the Venetians in time became the carriers of this merchandise into distant countries, they were enabled to bring back raw materials for various manufactures which greatly enlarged their commercial dealings. In this manner, Venice first, and Genoa, Florence, and Pisa afterward, from inconsiderable places became populous and wealthy cities, and laid the foundation for the revival of commerce throughout the Mediterranean, which, in process of time, was extended to the countries of Europe without the straights of Gibraltar. The chief cities of Italy, were, for several centuries, the only places in Europe, west of the Eastern or Greek empire, which had any considerable commerce, or any valuable manufactures for the supply of other nations. Their merchants frequented Aleppo, Tripoli, Alexandria, and other ports of Syria and Egypt, where they procured the produce of India; and visiting the maritime towns of Spain, France, the Low Countries, and England, by distributing their commodities over Europe, communicated to its various nations some taste for the valuable productions of the east, as well as some ideas of manufactures and arts, which were then unknown beyond the precincts of Italy.
COMMERC.

The first mention of the city of Antwerp, afterwards so famous for its trade, is in the year 517, when Theodoric expelled the Danes from it. Some towns in England, as Chichester and Abingdon, are said to have been founded about this time, which shews that trade and manufactures were gaining ground in this country.

The unsettled state of Europe, arising from the fierce and ruthless disposition of the barbarous tribes who had taken refuge in the west, commended for several centuries a great flagellation of commercial intercourse. Venice however continued to improve its commerce, and London became "a mart town of many nations, which repaired thither by sea and land." Some of the Italian cities began to assume a degree of independence, and several towns were founded in Germany and Flanders, which afterwards became of much commercial importance. The commerce of Europe revived a little under the government of Charlemagne, who, among other endeavours to promote it, is said to have formed a project for uniting the two great rivers of the Rhine and the Danube, and thus forming a communication between the German ocean and the Black sea, without falling up the Mediterranean. But his engineers had not sufficient skill to overcome the difficulties they met with, and the undertaking was soon relinquished. In a letter from this prince to Offa, king of Mercia, he grants leave for such English as went in pilgrimage to Rome, to pass through his dominions free; but such as travelled for the purposes of trade were to pay the customary tolls; and promises that the merchants should have legal patronage and redress of grievances. These merchants were probably persons who carried their whole stock with them, which of course could not be of any very great amount.

The establishment of Christianity in Germany produced a much more intimate and regular correspondence between the north of Europe, and the earlier Christianized countries of Italy, France, Spain, and Britain; so that their superfluities and produce were mutually communicated to each other, while Germany received by degrees, from its intercourse with those countries, considerable improvements with respect to agriculture, mining, vine-dressing, manufactures, and the arts, more immediately conducive to the comforts of civilized life. It considerably increased the cities and towns, where cathedral churches and houses for the bishops and clergy were erected. Thus the propagation of Christianity greatly favoured the advancement of commerce in the north of Europe; while Charlemagne by his conquest of Italy, and by rebuilding and restoring many of the decayed cities of that country, inspired those cities with the spirit of commerce, manufacture, and navigation, for which they became in after times so jolly famous. This period may be considered as the first dawn of the revival of commerce in Europe; for although subsequent to this time the Saracens or Moors, and the Normans, by their ravages and conquests in various parts, greatly obstructed and retarded its progress, yet in spite of all opposition, the free cities in both the extreme parts of Europe in consequence of the increase of their wealth and population from the encouragement of commerce, gradually rose to very considerable importance.

In the tenth century, the commercial intercourse which the Germans had previously cultivated with the neighbouring states was much increased by the discovery of valuable silver mines at Gollar in Saxony, which occasioned other parts of Germany to be explored for mines with considerable success. The woollen manufacture of Flanders began to acquire some degree of importance, being much encouraged by Baldwin, third earl of Flanders, who invited into the country all manner of handcraftsmen for making all sorts of manufactures, to whom he granted great privileges. He also established annual fairs, and fixed markets on stated days of the week at Bruges, Courtray, Tournuit, Mont-Caffel, and other places, where merchants could exchange their goods for others; for by reason of the facility of money at that time, the Flemings dealt mostly by permission, or barter of one kind of merchandise for another; which we read also was the practice of almost all the Germans and Saracens.

The republic of Venice had now acquired so much wealth and strength by the great extension of her commerce, as to have become a formidable political state, and having annexed to their dominions many cities and towns on the east coast of the Adriatic sea, the doge of Venice assumed the title of duke of Dalmatia. They established a regular commercial intercourse with the Saracens of Egypt and Syria, "countries ever famous for the production of rice, sugar, dates, fauna, cassia, flax, linen, balm, perfumes, galls, wrought silk, wool, &c. besides the rich spices and precious stones of India, brought to those two countries; with all this rich merchandise, the Venetians now traded all over the western parts of Europe, and their immense profit." They obtained from the Greek emperors a freedom from all customs and taxes in their empire; and in the year 696 the emperor Otho III., likewise granted them various privileges, with a right to set up fairs in several parts of Germany, where they carried on a vail commerce. The crusaders contributed materially to the extension of commerce during the 11th and 12th centuries. The Genoese, the Pisans, and the Venetians, furnished the transports necessary to carry the vail armies that embarked on the wild enterprises; they also supplied them with provisions and military stores. Besides the immense sums which they received on this account, they obtained commercial privileges and establishments of great consequence, in the settlements which the crusaders made inPalestine, and in other provinces of Asia. From these sources they acquired great wealth, and a proportionate increase of power. By the expeditions into Asia, the inhabitants of all the states of Europe had an opportunity of observing the manners, the arts, and the accommodations of people more polished than themselves. The adventurers who returned from Asia communicated to their countrymen the ideas which they had acquired, and the habits of life they had contracted by visiting more refined nations. The Europeans began to be sensible of wants with which they were formerly unacquainted; and such a taste for the commodities and arts of other countries gradually spread among them, that they not only encouraged the return of foreigners to their harbours, but began to perceive the advantage and necessity of applying to commerce themselves.

The great commercial progress of the city of Lubeck soon caused other towns to be founded in the neighbourhood of the Baltic; which, suffering much from the occasional attacks of neighbouring powers, and the depredations of pirates, were induced to enter into an association for their mutual safety, and the protection of their navigation. Thus was gradually formed the famous Hanseatic confederation, which made to great a figure in the commercial history of several succeeding centuries, and of which Lubeck was from the first considered as the director or head. Werdenhagen fixes on the year 1169 for the first of this confederacy, which consisted of the twelve following towns on the Baltic shore: viz. Lubeck, Wismar, Rostock, Stralsund, Grypewald, Anslam, Stettin, Colberg, Stolpe, Danzet, Ebing, U and
and Koningsberg: though probably not all of them at the first; as some of them do not appear to have been founded till a later period. Lambeceur, librarian to the emperor Leopold, is of opinion, that the Han-ligue did not properly commence till after the league between Lubec and Hamburg in 1241, at which time the town comprehended in this association were in possession of all the commerce of the four shores of the Baltic, from Denmark to the bottom of the Gulf of Finland, besides an extensive commerce to more distant parts. About this time the commerce of Norway began to acquire some degree of importance, and in a treaty between the monarch of that country and Henry III. of England, in 1217, it was agreed that their respective states should be free for merchants and others on both sides.

At the beginning of the 13th century, the German merchants of the Steel-yard engaged all the foreign commerce which then existed in England, at that time had very few merchants, and fewer ships of her own. About 1250, however, a society of English merchants was formed, who were laid to have had privileges granted to them in the Netherlands, by John duke of Brabant; whither they had begun to refort with English wool, lead, and tin, bringing in return fine woollen cloths, linen, and other articles. From this society, the company styled "Merchant of the Baptist," took its rise. In 1274, a treaty was concluded with the earl of Flanders for the settlement of some commercial disputes which existed between the two countries.

France at this period possessed very little foreign commerce, but in the cities of Italy it had increased greatly. The republic of Genoa was in its meridian glory, being the greatest maritime power then existing. Even Venice, great as it was now become, was eclipsed by Genoa, which, towards the conclusion of this century, had reduced the republic of Pisa, till then also powerful at sea, to the lowest ebb of fortune, never again to rise to greats, and soon to lose her independence.

A new era was now about to commence in commercial history. The discovery of that valuable, but now familiar instrument, the mariner's compass, Dr. Robertson observes, may be laid to have opened to man the dominion of the sea, and to have put him in full possession of the earth, by enabling him to visit every part of it. But the effects of this discovery were not so sudden or extensive as might be expected. The use of the compass enabled the Italians to perform the short voyages to which they were accustomed, with greater security and expedition, but near half a century elapsed, before navigators ventured into any seas which they had not been accustomed to frequent. One of the first fruits of such adventures, was the discovery of the Canary islands by the Spaniards.

Many of the princes of Europe were now becoming more sensible of the importance of commerce, which led them to enter into treaties for its regulation and defence. Edward I. in 1302 published his famous charter styled Charta Mercatoria, by which "The merchants of Almaine, France, Spain, Portugal, Navarre, Lombardy, Florence, Provence, Catalonia, Aquitaine, Thouline, Flanders, Brabant, and of all other foreign parts, who shall come to traffic in England, shall and may safely come with their merchandize into his cities, towns, and ports, and fell the fame, by wholesale only, as well to natives as to foreigners." Some particular articles they were allowed to sell by retail; and they were to export any goods they might want from England on paying the usual customs, except wine, which could not be exported without a special licence. The countries here mentioned shew the parts to which the commerce of England was at that time chiefly confined; and a very good idea of its extent may be gained from the following account of the exports and imports, in the 28th year of Edward III. from a record in the Exchequer.

**Exports.**

<table>
<thead>
<tr>
<th>Item</th>
<th>L.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>31,651 1/2 facks of wool, at six pounds per fack, and 3236 hundred weight and 63 fells, each hundred weight being 6 score, at forty shillings per hundred weight, with the customs, &amp;c. thereon, amounted to</td>
<td>277,605</td>
<td>2 9</td>
</tr>
<tr>
<td>Leather, with its custom</td>
<td>95 2 6</td>
<td></td>
</tr>
<tr>
<td>47,4 1/2 coarse cloths, at 43 shillings each, and 385,16 1/2 pieces of worsted, at 15s. 8d. per piece</td>
<td>16,265</td>
<td>13 4</td>
</tr>
<tr>
<td>Customs thereon</td>
<td>- 15 13 7</td>
<td></td>
</tr>
<tr>
<td><strong>Total Exports, with the duties thereon</strong></td>
<td>294,184</td>
<td>17 2</td>
</tr>
</tbody>
</table>

**Imports.**

<table>
<thead>
<tr>
<th>Item</th>
<th>L.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1231 fine cloths, at 6l. per cloth, which, with the customs, comes to</td>
<td>11,033</td>
<td>12 9</td>
</tr>
<tr>
<td>397 1/2 hundred weight of wax, at 40 shillings per hundred weight, which, with the customs, comes to</td>
<td>815</td>
<td>7 5</td>
</tr>
<tr>
<td>1830 1/2 tons of wine, at 40 shillings per ton, which, with the custom, comes to</td>
<td>3,844</td>
<td>10 0</td>
</tr>
<tr>
<td>Linen cloth, mercery, grocery, and all other wares whatever</td>
<td>22,943</td>
<td>6 10</td>
</tr>
<tr>
<td>On which the custom was</td>
<td>285</td>
<td>18 3</td>
</tr>
<tr>
<td><strong>Total Imports, with the duties thereon</strong></td>
<td>38,970</td>
<td>5 6</td>
</tr>
</tbody>
</table>

Thus, as Sir William Temple observes, "when England had but a very small foreign commerce, we were rich in proportion to our neighbours, by selling so much more than we bought." It is not very probable, however, that the exports of the commerce was generally so great as is here stated.

The materials of commerce were now increasing by the improvement of manufactures in various parts of Europe; while the discoveries of the Portuguese on the coast of Africa, and in the adjacent seas, excited a more enterprising spirit of mercantile adventure, and at length, in 1497, led to the discovery of the Cape of Good Hope, which they doubled about ten years after, and thus accomplished the first regular voyage to the East Indies. About the same time also was accomplished the great discovery of the western continent. These events, which filled the world with astonishment, and gave rise to an infinity of new speculations, have since supplied it with a prodigious increase of wealth, and with many new and excellent materials for the immense additional commerce which has thus accrued to all the states of Europe.

The whole of the vast regions discovered in the East and West, was by the papal authority divided between the Spaniards and Portuguese. The former first made herself mistress of the islands, and next of the principal part of the continent of America; in consequence of which the cities of Seville and Cadiz became the store-houses for the riches of the newly-discovered western world. Portugal pursued her commerce and rapid conquests in the East Indies, so that
COMMERCE.

Lisbon soon became (what the now declining city of Venice had been for many centuries paid) the great magazine for all the rich productions of the East. They had also discovered Brazil in South America, which soon became an almost inexhaustible fund of wealth to Portugal, which may be said to have been then at the height of its commercial greatness.

In the course of the 16th century many circumstances occurred which contributed greatly to the extension of commerce. The English in the pursuit of a north-west passage to India had discovered the whole coast of North America, where, after some years, they began to attempt settlements. They engaged in the Newfoundland fishery, and also in the whale fishery at Spitsbergen or Greenland. The continual jealousies and disputes between the English merchants and the German Hanseatic merchants of the Steer yard in London, were at length terminated by the abolition of the peculiar privileges of the latter. The discovery of a passage to Russia round the north Cape of Lapland, opened a field for other new discoveries, and new branches of commerce, in consequence of which a company for trading to Russia was immediately formed and incorporated. The commerce with Turkey was encouraged by the incorporation of a company; and the intercourse with Guinea and other places on the coast of Africa, was at first thought of sufficient importance to have a company established for carrying it on.

While the importance of the Italian cities was declining, and the commerce of the towns on the Baltic experiencing some diminution, the cities of Hamburg and Antwerp had risen into considerable importance. The latter in particular, from the convenience of its situation, might for some time be considered as the centre of the commerce of Europe, as well for the merchandise of both the Indies, as for the naval stores and other bulky commodities of the northern states. It was however soon to find a rival among its industrious neighbours in the United Provinces, who, from the time of their independence, applied themselves to manufactures and commerce with the utmost avidity. France was at this time beginning to encourage the cultivation of the vine, and the improvement of her broad silk manufacture; while Spain, by expelling the Protestants from the Netherlands, supplied England, Holland, and the Hanse towns with great numbers of wealthy and industrious manufacturers and artizans, as well as with an accession of many ingenious and beneficial new manufactures.

The 17th century was the period in which the principles were adopted, and most of the establishments formed, which have contributed to advance the commerce of Europe to its present astonishing height. The interests of nations became better understood than in any former age; the utility of commerce had become evident to every one, from the wealth and power it had conferred on the states which had encouraged it; and commercial treaties became frequent between the different nations. Navigation was improved; new settlements were formed, and many of those before made were rising into importance; manufactures were advancing in many parts of Europe; shipping was increasing, and the intercourse between distant places, from the accumulation of knowledge and experience, becoming more expeditious and secure.

The lucrative commerce of the East became one of the leading objects of mercantile pursuit. An English East India company was formed in 1600; and the Dutch companies, which were united in 1602, became one of the most celebrated commercial establishments ever formed. The French visited the East Indies in 1601, but did not establish a regular company for carrying on the trade till 1664. The Danes established an East India company in 1617, and in 1612 the king of Sweden issued letters patent for forming an East India company, but it was not carried into execution till some years after. The Spaniards and Portuguese, however, at this period, possessed by far the greatest share of the commerce of India, which had now become very considerable. The following account published by Mr. Munn, in 1651, of the quantity of Indian merchandise consumed annually in Europe, gives a very good idea of the proportion of the different articles of this branch of commerce: the prices affixed are the prime cost in India, including all charges till actually shipped for Europe.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Price per lb</th>
</tr>
</thead>
<tbody>
<tr>
<td>6,000,000 lb. pepper</td>
<td>at 0 2/3 per lb.</td>
<td></td>
</tr>
<tr>
<td>4,500,000 lb. cloves</td>
<td>at 0 9 per lb.</td>
<td></td>
</tr>
<tr>
<td>1,300,000 lb. mace</td>
<td>at 0 8 per lb.</td>
<td></td>
</tr>
<tr>
<td>43,000,000 lb. nutmegs</td>
<td>at 0 4 per lb.</td>
<td></td>
</tr>
<tr>
<td>35,000 lb. indigo</td>
<td>at 1 2 per lb.</td>
<td></td>
</tr>
<tr>
<td>1,000,000 lb. raw silk</td>
<td>at 8 0 per lb.</td>
<td></td>
</tr>
</tbody>
</table>

This statement was probably meant to include only the principal articles; at least it is certain that about 1651 several other kinds of merchandise were usually imported from India, as taffalics, painted callicoes, drugs of various sorts, and China ware. Tea, the great object of commercial intercourse with China, was either not yet an object of commerce, or was imported in such small quantities, that in England at least, in 1660, it was not thought of sufficient consequence to be subjected to a duty.

Dr. Davenant, who published his "Discourses on Trade" in 1698, was of opinion, that from about the year 1550 to 1688, England had every year gradually increased in riches; and that about the last mentioned year, the increase or addition to the wealth, and general flock of the nation, arising from foreign trade and home manufactures, was at least two millions per annum. In this estimate the different branches of trade are stated as follows:

- The plantation trade may bring in £ 600,000
- The East India trade may bring in 500,000
- The European, African, and Levant trade, by our own product may bring in 600,000
- Ditto, by re-exports of plantation goods 120,000
- Ditto, by re-exports of East India goods 180,000

Total 2,200,000

This account is probably somewhat beyond the truth, with respect to the period to which it refers; but that there had been a considerable influx of wealth, is shewn by the observations of the same author, that from the year 1600 to 1688, the general rent of England was nearly trebled, and the produce of land half doubled; that the flock of the kingdom was multiplied above five fold, and the money in circulation above four fold. This rapid advance in wealth, can be ascribed to no other cause than the improvement of commerce, which was now becoming of the utmost importance to all the European states, particularly to such as were deficient in maintaining any degree of naval power.

The increase of wealth arising from the extension of commerce, gave rise to the establishment of banks, by which its operations have of late years been so much facilitated. The commercial cities of Venice and Genoa had long experienced the utility of such institutions, which were now adopted in other places. The banks of Amsterdam, of

Hamburg,
Hamburg, and of Rotterdam were established; and in 1694, the bank of England, and the bank of Scotland. The business of private bankers likewise took its rise, and had become considerable, when it received a fever check from the injudicious conduct of Charles II. in seizing the money which the bankers had advanced on credit of the state. This branch of mercantile intercourse has however been since carried to an extent which in former times would have been deemed wholly incredible.

But with its principles generally understood, with most of the establishments formed which are necessary to facilitate its operations; with laws and treaties in force for its encouragement and protection; markets established for the purchase or sale of commodities in almost every part of the globe; navigation brought to a high degree of perfection, salt improvements in arts and manufactures; and a great increase of artificial wants from the progress of luxury and refinement, the commerce of the world, and particularly of Europe, has during the 18th century, expanded in an astonishing degree, and become intimately connected with the political existence of almost every state.

Commerce of Great Britain. The most authentic materials from which an idea can be formed of the progress and extent of the commerce of Great Britain, are the accounts kept in the office of the inspector-general of exports and imports, at the custom-houses of London. These accounts do not show the current value of the commodities exported or imported, but are formed from their quantities, according to certain rates of value, fixed to the several articles of foreign trade in 1696, by which they have been rated ever since. It is evident, therefore, that, as the price of all kinds of merchandise is subject to great fluctuations, and in general has much increased in this country within the last hundred years, these accounts are far from shewing the actual values in the later years; they are, however, from this very circumstance of being uniformly made up at the same rates, the better adapted to a comparative view, and shew a progressive increase which has arrived to an amount never before known in the commerce of any nation. According to these estimates the total amount of the exports and imports of Great Britain have been as follows:

<table>
<thead>
<tr>
<th>Years</th>
<th>Exports</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1700</td>
<td>£7,603,716</td>
<td>£5,979,175</td>
</tr>
<tr>
<td>1701</td>
<td>7,603,716</td>
<td>5,979,175</td>
</tr>
<tr>
<td>1702</td>
<td>5,869,660</td>
<td>4,139,904</td>
</tr>
<tr>
<td>1703</td>
<td>4,526,596</td>
<td>3,373,260</td>
</tr>
<tr>
<td>1704</td>
<td>4,201,649</td>
<td>3,101,933</td>
</tr>
<tr>
<td>1705</td>
<td>9,402,455</td>
<td>7,274,055</td>
</tr>
<tr>
<td>1706</td>
<td>4,638,660</td>
<td>4,113,933</td>
</tr>
<tr>
<td>1707</td>
<td>6,447,858</td>
<td>4,251,391</td>
</tr>
<tr>
<td>1708</td>
<td>6,265,808</td>
<td>4,251,391</td>
</tr>
<tr>
<td>1709</td>
<td>6,265,808</td>
<td>4,251,391</td>
</tr>
<tr>
<td>1710</td>
<td>6,265,808</td>
<td>4,251,391</td>
</tr>
<tr>
<td>1711</td>
<td>6,265,808</td>
<td>4,251,391</td>
</tr>
<tr>
<td>1712</td>
<td>6,265,808</td>
<td>4,251,391</td>
</tr>
</tbody>
</table>

At the conclusion of the war, by the peace of Utrecht, a commercial treaty with France was likewise negotiated; but when the particulars of it came to be discussed, two of the articles, by which the produce and manufactures of France were to be admitted into this country on the same terms as those of the most favoured nation, excited such general disapprobation, that the bill for carrying it into effect was rejected by the house of commons. The strongest objection to the principle of the treaty, was that it might ruin the trade then carried on with Portugal, which was considered as the most valuable branch of our European commerce.

It is evident, that from the year 1705, notwithstanding the disadvantages it always labourers under in time of war, commerce had been gradually increasing; but when peace enabled it to return to its natural channels, and restored some branches which had been considerably interrupted, its general advancement became more obvious, and although from the mode then chiefly adopted, of judging of the profits of commerce merely by the excess of the value of the exports, the balance appeared less than it had been in former years, the wealth which flowed into the country from foreign trade, being no longer absorbed in public wars, soon enabled the government to make a permanent reduction in the legal rate of interest. The war with Spain in 1710 did not cause much interruption of commercial intercourse, except in the direct trade with that country.

<table>
<thead>
<tr>
<th>Years</th>
<th>Exports</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1713</td>
<td>£7,580,621</td>
<td>£7,094,708</td>
</tr>
<tr>
<td>1714</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1715</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1716</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1717</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1718</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1719</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1720</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
<tr>
<td>1721</td>
<td>7,580,621</td>
<td>7,094,708</td>
</tr>
</tbody>
</table>

At this period the judicious principle of promoting the exportation of British manufactures, which had hitherto been applied only to woollen goods, was extended to British manufactures and produce in general; which were allowed to be exported duty free, except a few articles chiefly materials for manufactures, the exportation of which it would not have been proper to encourage; while drugs and other materials used for dyeing, were, upon being first duly entered, to be imported duty free, but upon re-exportation were to pay specific duties. For this highly beneficial regulation, so simple in its principle, and so comprehensive in its extent, the country was indebted to the enlightened wisdom of Mr. Walpole: the experiment excited much doubt and solicitude as to its success, but it soon appeared that the loss of revenue in the duties thus given up, was more than compensated for by the greater stimulus it gave to manufactures and the consequent extension of commerce.

<table>
<thead>
<tr>
<th>Years</th>
<th>Exports</th>
<th>Imports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1722</td>
<td>£6,376,489</td>
<td>£5,965,789</td>
</tr>
<tr>
<td>1723</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1724</td>
<td>6,052,464</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1725</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1726</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1727</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1728</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1729</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1730</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1731</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1732</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
<tr>
<td>1733</td>
<td>6,376,489</td>
<td>5,965,789</td>
</tr>
</tbody>
</table>

The above period was almost wholly a time of peace, during which the commerce of Great Britain was gradually advancing.
advancing, both from the improvement of several of the existing branches, and the acquisition of new ones. The South-Sea company undertook the Greenland whale fishery, which had been entirely relinquished by this country for some years past; and encouragement was given to fisheries on the coast of America. Attempts were made to obtain a share of the fur trade of North America, which was almost entirely in the hands of the French. The Holland East India company, which had been found prejudicial to the English trade in that part of the world, was suppressed; and while our trade with China increased considerably, particularly in the article of tea. The trade of the Levant company was very flourishing; as was likewise that of the Hudson's bay company, though the latter was but of small extent. The produce of several valuable commodities was at the same time augmenting, from an increased cultivation of rice in the American colonies, and of coffee in the West India islands, while great quantities of corn were annually exported from Great Britain to France, Portugal, Spain, and Italy.

The war which began in 1739, was occasioned chiefly by disputes respecting our commerce in the West Indies, which had been much interrupted by the Spaniards. It caused, at first, some decline of foreign trade, which however soon regained the extent to which it had been carried during the preceding peace.

At this time, a much greater proportion of the exports consisted of unmanufactured produce than it has since; as it appears there had been exported from England in five years, from 1744 to 1748, no less than 3,768,444 quarters of corn, which at medium prices was worth 8,007,948 l.

That a considerable increase of commerce had taken place, is evident from the quantity of shipping employed. The total tonnage of vessels that cleared outward on an average of three years preceding the war, had been 503,568 tons; the average of the three years, ending with 1751, was 661,184 tons. The encouragement of the fisheries, and the regulation of the Guinea or African trade, which had been in the hands of an exclusive company, but was now in a great measure laid open; caused some extension of foreign trade, although the Levant, or Turkey trade, which had been considered as one of the most valuable branches, was beginning to decline rapidly, from the French improving the natural advantages they possessed for a trade with those parts.

<table>
<thead>
<tr>
<th>Years</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1759</td>
<td>8,202,576</td>
<td>14,569,624</td>
</tr>
<tr>
<td>1760</td>
<td>5,981,804</td>
<td>15,579,073</td>
</tr>
<tr>
<td>1761</td>
<td>9,143,601</td>
<td>16,285,913</td>
</tr>
<tr>
<td>1762</td>
<td>8,879,234</td>
<td>14,134,933</td>
</tr>
</tbody>
</table>

It is evident that commerce had not been very materially affected by the war. The years 1755 and 1756 marked the lowest point of its depression; whence it gradually rose, till it had regained a superiority over the unexplored traffic of 1750, a year of established peace and security.

By the peace of 1763, although many islands which had been taken in the West Indies were restored, Great Britain retained a number of newly acquired islands, perhaps more than could be immediately brought into cultivation with advantage. The arrangements respecting Africa were very favorable to the East India company, and in Africa an exclusive trade was secured in the article of gum Senegal, a material indispensably necessary to the perfection of many of our manufactures. The immediate consequence, however, of the acquisition of additional territories, was, that a wide field was opened for speculation and commercial enterprise, which caused much productive capital to be withdrawn from the trade and manufactures of Great Britain; yet our merchants were not only able to maintain their own credit, but also to affix their correspondents during the commercial embarrassments in Holland and other parts of the continent.

In 1765, the principles and measures which were adopted which soon involved the country in disputes with its American colonies. The violent restrictions were laid on a beneficial intercourse which had long subsisted between the British colonies and the Spanish West India settlements; which being soon followed by other causes of discontent, drove the Americans into public resolutions to make no further importations from Great Britain, but such as were unavailing necessary, and to encourage, to the utmost of their power, every kind of manufacture that was practicable among themselves. This step was taken by Great Britain; the merchants connected with America found themselves unable to fulfill their engagements by the copious ships now imported from the country; the whole list of their business was destroyed, and general distress spread through the whole of their relations; the manufacturers suffered by the want of regular payments from the merchants, while their materials, and made up goods, to an alarming amount, were becoming a dead stock upon their hands; in consequence of which, great numbers of workmen were thrown out of employ. Petitions were presented to parliament from all the trading and manufacturing towns, which probably had some effect in procuring a temporary adjournment of the dispute.

The non-importation agreement in America, was renewed in 1769 and 1770; yet the commerce of Great Britain, notwithstanding these interruptions of an important branch of its trade, continued to increase; and previous to the war which followed, had attained to a greater extent than in any former years.

<table>
<thead>
<tr>
<th>Years</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1763</td>
<td>11,665,636</td>
<td>16,105,181</td>
</tr>
<tr>
<td>1764</td>
<td>10,684,307</td>
<td>14,514,403</td>
</tr>
<tr>
<td>1765</td>
<td>10,389,742</td>
<td>13,552,157</td>
</tr>
<tr>
<td>1766</td>
<td>11,757,728</td>
<td>14,024,064</td>
</tr>
<tr>
<td>1767</td>
<td>12,379,515</td>
<td>13,848,511</td>
</tr>
<tr>
<td>1768</td>
<td>11,388,601</td>
<td>15,117,082</td>
</tr>
<tr>
<td>1769</td>
<td>11,908,568</td>
<td>13,438,236</td>
</tr>
</tbody>
</table>

1770
The prohibition of all trade intercourse with the American colonies excited serious alarms, not only on account of the loss of a valuable branch of trade, but from the supposed encouragement which the acquisition of it would give to the trade of those powers who afflicted the colonies. These apprehensions, however, in a few years appeared to be in a great measure groundless, many British manufacturers found their way to America, though not imported directly from hence; and Mr. Chalmers observes, that "there was an evident tendency in our traffic to rise in 1779, till the Spanish war imposed an additional burthen. There was a similar tendency in 1780, till the Dutch war added, in 1781, no inconconsiderable weight. And the year 1781, accordingly, marks the lowest degree of depredation, both of our navigation and our commerce, of our colonies. But with the same vigorous spirit, they both equally rose, in 1782, as they had risen in former wars, to a superiority over our navigation and commerce, during the year wherein hostilities with France began."

The opportunity of renewing the commercial connections between this country and America, from the conclusion of peace, was eagerly embraced; but subsequent experience proved, that a greater degree of caution had now become necessary to render it a beneficial trade. The arrangements relative to the commerce of Ireland, had a very beneficial effect in that country, which had hitherto been excluded from almost every species of commerce, and restrained from sending the produce of her own soil to foreign markets. The convention with Spain settled more accurately the limits within which British subjects were allowed to cut lumber on the Musquito coast, and consequently gave greater certainty and security to the trade with those parts. The commercial treaty with France, by discontinuing many of the prohibitions and prohibitory duties which had existed for almost a century between the two nations, opened a wide field for speculation and adventure. The confederation of the customs by the abatement of all the confused and complex duties which then existed, and the substitution of a single duty on each article in their stead, was a measure of great convenience to all persons engaged in mercantile transactions. Under all these circumstances, supported by the improvements which had taken place in several of the principal manufactures, the foreign trade of Great Britain increased greatly during the peace, and in the year 1792, had attained to an unparalleled height, both in point of value, and with respect to quantity of shipping employed in it.

The total number of vessels which belonged to the several ports of the British empire on the 30th September 1792, was 16,577; the amount of our merchant marine 4,543,143 tons; and the number of men and boys usually employed in navigating them 718,285. The number of vessels that entered inward at the several ports of Great Britain (including their repeated voyages) was as follows:

<table>
<thead>
<tr>
<th>Ships</th>
<th>Tons</th>
</tr>
</thead>
<tbody>
<tr>
<td>British</td>
<td>- -</td>
</tr>
<tr>
<td>Foreign</td>
<td>- -</td>
</tr>
<tr>
<td>Total</td>
<td>14,507</td>
</tr>
</tbody>
</table>

At this period, the commerce of Great Britain, was generally admitted to be in a very flourishing state. The application and improvement of machinery in almost every branch of manufacture, had reduced the charges of workmanship so far, as to enable our manufacturers to supply foreign markets on better terms than any other country could offer; while the increase of capital, arising from the accumulation of the profits of successful commerce during a period of peace, gave our merchants the means of allowing longer credit than could be obtained elsewhere. The high price of the public funds, led many persons to employ their money in discounting private securities, which greatly facilitated the extension of commercial credit, but probably tempted some to trade much beyond the amount which their capital justified, or to speculate largely without any real property of their own; so that when the apprehension of war produced a greater degree of caution, and began to affect particular branches of trade, many were involved in embarrassments; and on the commencement of the war in 1793, commercial concerns, in general, experienced a serious shock. The assistance afforded by government to such houses as appeared to be really solvent, by lending them exchequer bills for a certain time, operated very successfully, and averted the confidences that were apprehended; credit revived, and as the war in its progress almost annihilated the foreign trade of some of the powers engaged in it, the commerce of Great Britain received a considerable augmentation; and, protected by its naval superiority, continued to increase, notwithstanding all the measures which political animosity could devise to obstruct or destroy it.
The increase during the above period, though really very great, was not however equal to what it would appear from the above accounts to have been. This irregularity in the comparative view of the accounts of imports and exports generally furnishes with sufficient accuracy, of the commerce of Great Britain, arises from the article of coffee, the import of which was formerly little more than sufficient to supply its small consumption in the country. But the interruption of the trade of France, the conquest of their West India islands, and the greatly increased cultivation of coffee in Jamaica, caused nearly the whole supply of the continent with this commodity to depend during the war on Great Britain. In the inspector-general's book of rates, coffee is valued on importation at 7l. and on exportation, at no less than 14l. 10s. per cwt.; while, during the above period, the real average value was about 5l. per cwt. when imported, and 8l. 10s. when exported. The official account, therefore, from 1794, when coffee suddenly became a very considerable article of exportation, requires some correction; and if the un-estimated value of this article is deducted, the exports of the year 1803 will appear to have been 38,120,120l., and of 1804, 37,786,356l.

The short interval of peace in 1802, produced an immediate extension of foreign trade; and Mr. Addington thought himself justified "in pronouncing the commerce of the country to be in a state of unrivalled and unexampled prosperity." The value of British manufactures exported, considerably exceeded the preceding year, and the total amount of the exports, according to the official values, was 46,126,620l. But in this and the succeeding years, it will be proper to adopt the correction just mentioned, which will give the amount of the imports and exports as follows:

<table>
<thead>
<tr>
<th>Years</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1802</td>
<td>£ 31,442,318</td>
<td>£ 41,411,966</td>
</tr>
<tr>
<td>1803</td>
<td>£ 27,052,204</td>
<td>£ 31,579,455</td>
</tr>
<tr>
<td>1804</td>
<td>£ 20,013,490</td>
<td>£ 34,451,307</td>
</tr>
<tr>
<td>1805</td>
<td>£ 30,344,638</td>
<td>£ 34,954,845</td>
</tr>
<tr>
<td>1806</td>
<td>£ 31,094,189</td>
<td>£ 36,528,132</td>
</tr>
</tbody>
</table>

The account of imports for the last year is not quite correct; the imports from the East Indies for that year being incomplete.

Almost every article being greatly under-valued in these accounts (except in one or two instances) the total must give a very inadequate idea of the real extent of the commerce of Great Britain. Some idea may be formed of the under-valuation of the imports by those of the East India company, taking the account of their fàles as the importation; the medium value of which, on an average of three years, was 6,100,000l.; whereas, the medium value by the accounts of the inspector-general, for the same three years, was 4,574,000l. Of the actual value of British produce and manufactures exported, which usually constitutes about two-thirds of the total export, we have more correct information. By an act passed in 1798, and revived in 1802, called the convoy act, the exporters were required to declare the real value of British manufactures exported, in order to ascertain the amount of duty chargeable thereon; and from these declarations, the actual value of British produce and manufactures exported has been ascertained as follows:

<table>
<thead>
<tr>
<th>Years</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1798</td>
<td>£ 2,735,686</td>
<td>£ 2,974,357</td>
</tr>
<tr>
<td>1799</td>
<td>£ 2,770,731</td>
<td>£ 4,086,846</td>
</tr>
<tr>
<td>1800</td>
<td>£ 3,131,824</td>
<td>£ 3,744,199</td>
</tr>
</tbody>
</table>

Considerable endeavours have been made to improve the manufactures of Ireland, but with little success, except in the linen manufacture, which probably proceeds from the want of sufficient capital, and from the facility with which British manufactures can be procured at a very small additional expense; the latter will, therefore, for a long time, continue to constitute a large proportion of the imports of Ireland.

Value of British manufactures exported from Great Britain to Ireland.

<table>
<thead>
<tr>
<th>Years</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1791</td>
<td>£ 1,476,970</td>
<td>£ 1,718,789</td>
</tr>
<tr>
<td>1792</td>
<td>£ 1,511,844</td>
<td>£ 1,731,996</td>
</tr>
<tr>
<td>1793</td>
<td>£ 1,255,276</td>
<td>£ 1,657,924</td>
</tr>
<tr>
<td>1794</td>
<td>£ 1,281,316</td>
<td>£ 1,759,699</td>
</tr>
<tr>
<td>1795</td>
<td>£ 1,612,270</td>
<td>£ 1,879,965</td>
</tr>
</tbody>
</table>

The trade between Great Britain and Russia has been considered highly beneficial to both countries; to Russia in point of profit, and to Great Britain, as supplying articles essential to the support of its navy. The capital employed must be much greater than formerly, from the increased value of the principal articles; and the balance of trade, which is consider-
In favour of Russia, is paid by means of the commercial
transactions between Great Britain and other countries.
The articles imported are iron, hemp, flax, tallow, pat-ashes,
deals, and lath-wood, coarse linens, hog's bristles, &c.
The exports are principally broad-cloths and woolen stuffs,
refined sugar, cotton, lead, tin, iron and felt ware, earthen
ware and glafs, coals, alum, latt, horeses, London porters, with
articles of left importance.

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>£2,434,698</td>
<td>£1,025,377</td>
</tr>
<tr>
<td>1801</td>
<td>£2,316,877</td>
<td>£919,543</td>
</tr>
<tr>
<td>1802</td>
<td>£2,136,430</td>
<td>£1,376,999</td>
</tr>
</tbody>
</table>

The total number of vessels that entered from
Russia, and that cleared out for that country from Great
Britain in three years, ending with 1806, was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Inwards (British)</th>
<th>Inwards (Foreign)</th>
<th>Outwards (British)</th>
<th>Outwards (Foreign)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1804</td>
<td>830</td>
<td>29</td>
<td>57</td>
<td>33</td>
</tr>
<tr>
<td>1805</td>
<td>1,066</td>
<td>21</td>
<td>927</td>
<td>32</td>
</tr>
<tr>
<td>1806</td>
<td>1,066</td>
<td>21</td>
<td>927</td>
<td>32</td>
</tr>
</tbody>
</table>

The trade to Denmark and Norway, though of ancient
date, is not of very great extent; the imports consist chiefly
of timber and corn; and the exports, of West India produce
and other foreign merchandise; the quantity of British ma-
ufactured goods which those countries take being of small
amount.

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>£241,563</td>
<td>£540,683</td>
</tr>
<tr>
<td>1801</td>
<td>£208,794</td>
<td>£416,475</td>
</tr>
<tr>
<td>1802</td>
<td>£159,572</td>
<td>£337,517</td>
</tr>
</tbody>
</table>

The total number of vessels which entered from
Denmark and Norway, in the year 1806, was 1,607, of
which 529 were British ships; the total number which cleared
outwards was 1,610, of which 700 were British.

The trade with Sweden, which is carried on chiefly in
ships of that country, has not varied materially in its extent
during the last twenty years. The imports consist chiefly of
iron of a superior quality, pitch, tar, deal boards, and fall-
cloth. The exports are principally colonial produce.

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>£309,840</td>
<td>£78,840</td>
</tr>
<tr>
<td>1801</td>
<td>£295,645</td>
<td>£111,254</td>
</tr>
<tr>
<td>1802</td>
<td>£327,350</td>
<td>£168,266</td>
</tr>
<tr>
<td>1803</td>
<td>£288,651</td>
<td>£98,045</td>
</tr>
</tbody>
</table>

The total number of vessels which entered from
Sweden, in the year 1806, was 333, of which 187 were Brit-
ish ships; the total number which cleared outwards was
363, of which 142 were British.

The imports from Prussia, consist of all kinds of grain,
hemp, flax, madder, linseed, goose-quills, bristles, pear-
stakes, mill-flours, and timber of various descriptions. The
exports are chiefly alum, copperas, coal, beer, salt, wrought
brails and iron, lead, tin plate, earthenware, glasses, woollen
and cotton goods, fome cotton yarn, India goods, raw and
refined sugar, drugs, dye-juices, pepper and other spices,
coffee, rum, tobacco, &c.

<table>
<thead>
<tr>
<th>Year</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1800</td>
<td>£1,749,604</td>
<td>£794,452</td>
</tr>
<tr>
<td>1801</td>
<td>£1,438,110</td>
<td>£669,739</td>
</tr>
<tr>
<td>1802</td>
<td>£1,057,602</td>
<td>£897,506</td>
</tr>
<tr>
<td>1803</td>
<td>£831,255</td>
<td>£910,502</td>
</tr>
</tbody>
</table>

The total number of vessels which entered from
Prussia in the year 1805 was 1,946, of which 37 were Brit-
ish ships; the total number which cleared outwards was
1,657, of which only 482 were British. In 1806 the total
numbers were much less, in consequence of Prussia being
involved in the war.

The trade with Germany had not experienced any con-
siderable variation with respect to its extent, from the com-
mencement of the last century, till on the extension of the
war with France in 1794, it suddenly became the channel
through which the principal part of the continent received
the goods they had before obtained direct from Great Brit-
ain. The following account of exports to Germany shows
the rapid increase of trade with that country during the
war.

<table>
<thead>
<tr>
<th>Year</th>
<th>British</th>
<th>Foreign</th>
</tr>
</thead>
<tbody>
<tr>
<td>1791</td>
<td>£718,474</td>
<td>£1,764,221</td>
</tr>
<tr>
<td>1794</td>
<td>£634,530</td>
<td>£4,000,953</td>
</tr>
<tr>
<td>1795</td>
<td>£1,705,137</td>
<td>£6,314,876</td>
</tr>
<tr>
<td>1796</td>
<td>£1,521,810</td>
<td>£6,542,479</td>
</tr>
<tr>
<td>1797</td>
<td>£1,654,967</td>
<td>£6,419,587</td>
</tr>
<tr>
<td>1798</td>
<td>£2,042,774</td>
<td>£6,653,992</td>
</tr>
<tr>
<td>1799</td>
<td>£2,182,430</td>
<td>£6,619,687</td>
</tr>
<tr>
<td>1800</td>
<td>£4,354,120</td>
<td>£6,304,792</td>
</tr>
<tr>
<td>1801</td>
<td>£4,938,617</td>
<td>£6,154,687</td>
</tr>
</tbody>
</table>

The total number of vessels which entered inwards in the
everal ports of Great Britain from Germany (including
Hamburg) and which cleared outwards for that country,
was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Inwards (British)</th>
<th>Inwards (Foreign)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1793</td>
<td>217</td>
<td>54</td>
</tr>
<tr>
<td>1794</td>
<td>258</td>
<td>168</td>
</tr>
<tr>
<td>1795</td>
<td>259</td>
<td>222</td>
</tr>
<tr>
<td>1796</td>
<td>347</td>
<td>347</td>
</tr>
<tr>
<td>1797</td>
<td>237</td>
<td>257</td>
</tr>
<tr>
<td>1798</td>
<td>408</td>
<td>113</td>
</tr>
<tr>
<td>1799</td>
<td>409</td>
<td>126</td>
</tr>
<tr>
<td>1800</td>
<td>435</td>
<td>459</td>
</tr>
<tr>
<td>1801</td>
<td>972</td>
<td>601</td>
</tr>
<tr>
<td>1802</td>
<td>1,025,093</td>
<td>6,308,613</td>
</tr>
<tr>
<td>1803</td>
<td>974,537</td>
<td>4,957,699</td>
</tr>
<tr>
<td>1804</td>
<td>620,403</td>
<td>1,565,555</td>
</tr>
</tbody>
</table>

The total number of vessels which entered inwards from
Holland in the year 1804 was 709, and the number which
cleared outwards 521. The number which entered inwards
in 1805 was 709; outwards 323; which, from the two
countries being at war, were of course nearly all neutral
vessels.

France possess fuch natural advantages in the produce of
its soil, and the convenience of its situation for procuring the
commodities of all other countries, that while its manufac-
tures
COMMERCE.

The trade with Portugal was formerly a very beneficial branch of our commerce, but has declined very much. The imports consist chiefly of wine, cotton-wool, and indigo, with considerable sums in cash and bullion. The exports are almost wholly British produce and manufactures.

The total number of vessels which entered inwards from Portugal in the year 1800 was 340, of which 270 were British vessels. The number which entered inwards in the year 1801 was 468; outwards 332.

The extent of the trade with Spain, previous to the war in 1796, will appear from the statement of imports and exports.

The year 1806 being a year of war, the trade with Spain was of course confined to neutral vessels: the number which entered inwards was 222, and the number which cleared outwards 126.

The Mediterranean trade was subject to much interruption during the war which began in 1793, in consequence of which many of the goods usually imported from Venice and Italy were brought over-land through Switzerland and Germany to Hamburg and Tonnningen to be shipped for England. The Turkey and Levant trade was formerly one of the principal branches of English commerce, but it is now of much less importance. The chief articles imported, are cotton-wool, mohair, goats' hair, opium, fennel, and other drugs, palls, madder, valonca, and other dye-stuffs, currants, figs, raisins, goat skins, and box-wood; raw silk was formerly a principal article, but very little is now brought from Turkey, that of Italy being much superior. The exports consist of lead, tin-plates, wrought and cast iron, hardware, a considerable number of watches, some cotton goods, and a few woolen goods, India piece goods, coffee, sugar, cinnamon, cloves, pimento, and other spices. The extent of the different branches of the Mediterranean trade will appear from the following statements.

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being principally intended for the purchase of slaves for the West Indies. They consisted of sugar, coffee, spirits of wine, coffee, press, guns and cutlasses, gunpowder, wrought brass, copper and iron, glass, cotton, hemp, rice, gr. cereals, specchecaries' ware, woollen, cotton, and linen goods, and large quantities of India piece goods. The total official value in the year 1800 was 4,017,357 l. 11s. 5d. of which 51,052 l. 19s. 11d. was British merchandise. The abolition of the infamous traffic in human beings, must cause a great revolution in the trade to this part of the world, as it appeared in the year 1786 that about 38,000 of the inhabitants of Africa were annually carried away in British ships for supplying the colonies with slaves, which of course employed a considerable number of vessels. The number of ships that cleared out from Great Britain for Africa, in the year 1801, was 176.

The East India trade furnishes a remarkable instance of the advantage of a branch of commerce carried on facetiously in the hands of an exclusive company, while most other commercial monopolies have made very small profits, and generally soon expired. The trade to India, however, since the immense territorial acquisitions of the English in that part, can no longer be considered as a mere commercial adventure, as it is now in a great measure a business of agency, for transacting in Europe the fortunes acquired by British individuals in the East. The quantity of merchandise brought from thence, consequently greatly, exceeds the value of the exports to India. The latter consists chiefly of woollens, metals, and naval and military stores; the remaining articles being of trifling amount in comparison, and almost wholly for the use of Europeans, as the natives are peculiarly attached to the use of their own produce and manufactures.

The exports to China include a considerable amount in bullion, the other articles are woolen cloths and camblets, lead, and tin; the articles exported in private trade are, cotton and flax, of various descriptions, jewellery, toys, and watches, cuttings of cloth, a very few woollens, some cutters, and hard ware, and silver. The amount of the company's exports to India and China, will appear from the following statements.

### India

<table>
<thead>
<tr>
<th>Season</th>
<th>Merchandise (l.)</th>
<th>Metalls (l.)</th>
<th>Stores (l.)</th>
<th>Bullion (l.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1781</td>
<td>200,806</td>
<td>157,614</td>
<td>163,878</td>
<td></td>
</tr>
<tr>
<td>1782</td>
<td>133,934</td>
<td>183,156</td>
<td>137,724</td>
<td></td>
</tr>
<tr>
<td>1783</td>
<td>93,254</td>
<td>125,800</td>
<td>72,017</td>
<td></td>
</tr>
<tr>
<td>1784</td>
<td>74,683</td>
<td>82,152</td>
<td>66,206</td>
<td></td>
</tr>
<tr>
<td>1786</td>
<td>122,709</td>
<td>97,899</td>
<td>85,197</td>
<td></td>
</tr>
<tr>
<td>1787</td>
<td>108,880</td>
<td>137,104</td>
<td>153,603</td>
<td></td>
</tr>
<tr>
<td>1788</td>
<td>118,440</td>
<td>99,028</td>
<td>152,587</td>
<td></td>
</tr>
<tr>
<td>1789</td>
<td>80,184</td>
<td>273,104</td>
<td>100,435</td>
<td></td>
</tr>
<tr>
<td>1790</td>
<td>75,121</td>
<td>191,044</td>
<td>120,515</td>
<td></td>
</tr>
<tr>
<td>1791</td>
<td>86,066</td>
<td>124,880</td>
<td>108,750</td>
<td></td>
</tr>
</tbody>
</table>

### China

<table>
<thead>
<tr>
<th>Season</th>
<th>Merchandise (l.)</th>
<th>Metalls (l.)</th>
<th>Stores (l.)</th>
<th>Bullion (l.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1781</td>
<td>120,179</td>
<td>163,349</td>
<td>2,206</td>
<td></td>
</tr>
<tr>
<td>1782</td>
<td>94,992</td>
<td>9,416</td>
<td>1,717</td>
<td></td>
</tr>
<tr>
<td>1783</td>
<td>113,763</td>
<td>4,579</td>
<td>1,743</td>
<td></td>
</tr>
<tr>
<td>1784</td>
<td>145,741</td>
<td>27,835</td>
<td>2,904</td>
<td></td>
</tr>
<tr>
<td>1785</td>
<td>224,012</td>
<td>37,939</td>
<td>7,583</td>
<td>77,437</td>
</tr>
</tbody>
</table>

The imports from the East Indies consist of Bengal piece goods, coast and Surat piece goods, Bengal and China raw silk, tea, pepper, saltpetre, mahanen cloth, china, wrought silks, a small quantity of china ware, sugar, coffee, indigo, and various drugs. The total amount of the imports, on the company's account, and in private trade, according to the official rates of the inspector-general's office, was as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Import</th>
</tr>
</thead>
<tbody>
<tr>
<td>1781</td>
<td>£2,436,390</td>
</tr>
<tr>
<td>1782</td>
<td>£1,520,391</td>
</tr>
<tr>
<td>1783</td>
<td>£1,304,345</td>
</tr>
<tr>
<td>1784</td>
<td>£2,906,347</td>
</tr>
<tr>
<td>1785</td>
<td>£2,703,347</td>
</tr>
<tr>
<td>1786</td>
<td>£3,157,347</td>
</tr>
<tr>
<td>1787</td>
<td>£3,368,347</td>
</tr>
<tr>
<td>1788</td>
<td>£3,438,347</td>
</tr>
<tr>
<td>1789</td>
<td>£3,658,347</td>
</tr>
<tr>
<td>1790</td>
<td>£3,078,347</td>
</tr>
<tr>
<td>1791</td>
<td>£3,098,347</td>
</tr>
<tr>
<td>1792</td>
<td>£3,098,347</td>
</tr>
</tbody>
</table>

But a more accurate idea of the real value of the imports from the East Indies, may be formed from the annual amount of the company's sales, which was

In 1801   £7,392,181
In 1802   £6,629,347
In 1803   £6,856,373

The East India trade is, in some respects, the most important branch of the commerce of Great Britain; as on the colonial produce which it supplies, much of the trade with different parts of Europe chiefly depends. The value of the British East India produce from the island islands, imported into Great Britain, is a medium of four years, preceding the 5th of January 1796, according to the current prices during that period, was estimated, exclusive of the duties, at about 6,800,000/. per annum. This sum is not wholly a return for goods exported, a part of it must be considered as remittances of the property of persons who posses titles in the East Indies, but who are wholly or occasionally resident in England; and of persons who have lent money on mortgage or otherwise in the East Indies, and receive their interest from the sale of the produce.

### Official Value of Imports from the East Indies

<table>
<thead>
<tr>
<th>Years</th>
<th>British</th>
<th>East Indies</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td>£6,159,617</td>
<td>£1,105,389</td>
<td>£7,264,906</td>
</tr>
<tr>
<td>1802</td>
<td>£7,293,316</td>
<td>£2,699,304</td>
<td>£9,992,020</td>
</tr>
<tr>
<td>1803</td>
<td>£5,755,432</td>
<td>£3,019,314</td>
<td>£8,774,746</td>
</tr>
</tbody>
</table>

The value of the British East India islands, in a commercial view, will be very conspicuous from the following statement of the total quantities of sugar, rum, coffee, and cotton-wool, exported from them.

<table>
<thead>
<tr>
<th>Years</th>
<th>Sugar</th>
<th>Rum</th>
<th>Coffee</th>
<th>Cotton-wool</th>
</tr>
</thead>
<tbody>
<tr>
<td>1801</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1802</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1803</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The total number of vessels which entered inwards from the West Indies, in the year 1804, was 721, containing 294,411 tons, and navigated by 1,119 seamen. The number of vessels which cleared outwards was 792. The value of British produce and manufactures exported to the British plantations in the West Indies, exclusive of the Conquered Islands, was £3,408,232.

The trade with the United States of America, has rapidly advanced to very considerable importance; and Great Britain now supplies them with commodities to a far greater amount, than in the most favourable years previous to their independence, although the number of British ships employed is considerably less. In the year 1789 the number of British vessels which entered inwards in this trade was 253, the number outwards 35; but in the year 1799, the number which entered inwards was only 42, the number outwards 57.

The total number of vessels which entered from the United States, in the year 1806, was 561, of which 33 were British; the total number which cleared outwards was 575, of which only 39 were British.

The remaining possessions of Britain in North America, being countries not very fertile or fully inhabited, the trade with them is not of very great extent. The following statement of the exports to those parts in the year 1809, will, however, show the trade is well worth preserving, independent of the consideration that it is the means of procuring articles of much importance to other branches of commerce.

<table>
<thead>
<tr>
<th>Years</th>
<th>Imports</th>
<th>Exports</th>
</tr>
</thead>
<tbody>
<tr>
<td>1798</td>
<td>£1,782,720</td>
<td>£5,580,372</td>
</tr>
<tr>
<td>1799</td>
<td>£1,818,941</td>
<td>£5,056,558</td>
</tr>
<tr>
<td>1800</td>
<td>£2,357,022</td>
<td>£6,885,597</td>
</tr>
</tbody>
</table>

With respect to the general balance of trade, or the ultimate profit which Great Britain derives from its commerce with all other countries, M. Living, the inspector-general of imports and exports, to whom the public have, for many years, been indebted for the judicious arrangement and explanation of the official documents relating to foreign trade, has justly remarked, that there are perhaps few questions to which the human attention can be directed more difficult to form an opinion upon, from the variety of considerations, and the various statements with which it is connected, and also from the materials on which conclusions are to be formed, being in some instances defective; he has, however, stated it as his opinion, that the balance of trade in favour of Great Britain, according to the true value of the goods exported and imported, amounted on a medium of the four years preceding 1798, to upwards of £650,000 per annum, exclusive of the profit derived from the East and West India trades, which he estimated at upwards of £450,000 per annum; and exclusive of the profits derived from the fisheries.

An accurate view of the progress and extent of commerce in all the European states, would furnish much information; but with respect to several, no authentic particulars of this kind have been made public, and the foreign trade of others has been so entirely turned out of its usual channels since the commencement of the war of the French revolution, that any account of its present state would be very incomplete and unsatisfactory.

With respect to domestic commerce, we may observe, that the king is the author of it; as it pertains to his prerogative to exhibit public acts, as markets and fairs, to regulate weights and measures, and to give money, which is the universal medium of commerce, authority and currency.

A great part of the foreign commerce of England is now carried on by collective companies: some incorporated by the king’s charters, with an exclusive privilege, as the East India company; others only private associations, as the Turkey and Hamburg companies. See Company.

COMMERCIA, Chambers f. Sce Chamber.

COMMERCIA, Characters in. See Character.

COMMERCIO, in Geography, a handsome town of France, and chief place of a district in the department of Meuse, on the western shore of that river. E. long. 5° 24' N. lat. 48° 29'. It has a sub prefet, and counts 3518 inhabitants. The district contains 181 communes, with a population of 73,123 individuals. There are several iron forges, paper mills, glue, and iron, and linen manufacturers. See BARKING.

COMMERCIO, in Botany. Somnus. See BARKING.


Gen. Ch. Cal. one-leafed, five-cleft, bearing the petals between the segments; segments egg-shaped, acute, larger and broader than the petals. Cor. Petals five, dilated at the base on each side, with an inflexed lobe, spreading. Stem. Filaments very short, setulose at the bale of the petals; anthers roundish, dilated. Nectary a five-cleft ring, between the petals and the germ, with five filiform villous small bodies between the divisions; divisions lanceolate, crested, shorter than the petals. Pyl. Germ superior, globular, villous, with five projections; styles five, filiform, approximating. Ber. Per. Capsule roundish, hard, ciliate with long soft bristle-shaped hairs, five-celled; two seeds in each cell. Seeds egg-shaped.


Sp. C. echinata. Linn. jun. Supp. 26. Mart. Linn. Gl. tab. 94. Lam. III. tab. 218. (Rehbtaria; Rumphi. Amb. 3. 167; tab. 119) A middle fixed tree. Trunk rarely the bulk of a man, with a diffuse head and smooth bark, easily separable from the wood; young branches woolly. Leaves alternate, petiolo, obliquely egg-shaped, acuminate, serrated, a little wrinkled, shining, dark green above
above, hoary underneath. *Flowers* very small, white, in axillary panicles. *Calyx* somewhat globular, with a coriaceous ciliate rind, five-locular, five-valved; cocii inversely egg-shaped, narrowing downwards, semilunar from the back, two-valved; valves of the contiguous cocii united and forming the proper partitions of the calyx. *Seeds* two in each cell, attached to the central angle of the cells, ovate-oblong, a little thicker upwards, slightly compressed, of a red-berruginous colour, blackish at the top, incompletely arilled; aril membranous, very thin, whitish, incised, fixed to the umbilicus of the seed, covering its hilum central, but not its dorsal part. *Gent.* A native of Othothe, the Friendly Isles, and the Moluccas.


A tree. *Leaves* alternate, lanceolate, quite entire, smooth, recurved. *Flowers* in axillary and terminal catkins. A native of Cochin-China. A white gum exudes abundant from its bark, which is sometimes used as a medicine in dropsies and obstructions, but is too violent in its effects to be taken without great caution.

**COMMINATORY,** a chafe infested in a law, edit, patent, &c. importing a punishment wherefor delinquents are menaced; which, however, is not to be executed in its rigour.

Thus, in France, when an exile is enjoined not to return on pain of death, it is deemed a comminatory penalty; hence, if he do return, it is not strictly executed; but a second injunction is then laid on him, which is more than comminatory, and from the day of the date thereof, imports death without remedy.

**COMMINES, PHILIP DE,** in Biography, a celebrated his- torian, was born of a noble family in Flanders in 1445. He spent the early part of his life in the court of Charles the Bold, duke of Burgundy; but in 1472 he went over to the service of Louis XI. king of France, who adopted him as a favourite, and employed him in various important negociations. He married an heiress of the house of Anjou, by whom he acquired considerable landed property. He accompanied his sovereign in many of his journeis and in some expeditions of a more fierce nature; and he attended upon his successor Charles VIII. to the conquest of Naples. Under this prince he was accused of having defrauded the excheque of the duke of Orleans, for which he was arrested, and imprisoned in an iron cage for eight months. He was afterwards transferred to a prison at Paris, where he was eighteen months without being able to obtain a trial. Commines was at length honourably acquitted, but it does not appear that, either in the remainder of this reign, or in that of the duke of Orleans who succeeded, and for whom he had suffered, he was afterwards publicly employed. He died at his seat of Argenton, in Poitou, of which he had been nominated the lord. Commines possessed various qualities well adapted to render him eminent as a statesman. He had a fine pen, and an excellent understanding: he was a complete master of many modern languages, and had so great a command of his own powers that he could dictate to four secretaries at once. As a literary character he is chiefly known for his "Memoirs," which contain an account of the principal events of the reigns of Louis XI. and Charles VIII. during a period of thirty-four years. This work is highly esteemed as an account of the personal knowledge and observation of the author, who united a sincere and candid disposition, with a simple and unaffected style. By the learned Lopitius, Commines is regarded as equal to the historians of antiquity; his "Memoirs" he recommends as the vade mecum of princes. They have gone through many editions, which have been illustrated with notes by different learned men; but the most esteemed impression is that of the abbé Lenglet du Plessy, 1747, in 4 vol. 4to, printed at Paris, with London in the title page. Nouv. Dict. Hist. Du Plessy.

**COMMININGES, in Geography,** (in Latin *Commines*,) was before the French revolution of 1789, a county in the province of Gascony, and forms now part of the department of Haute-Garonne in France.

**COMMINUTION,** the act of grinding, or breaking any matter into finer particles. — The effect of chewing, or malacifying our food is the comminution thereof.

**COMMIRE, JOHN in Biography,** a Jesuit, was born in 1625 at Amboife, where his father kept a tennis-court. He received a good education, and applied himself chiefly to classical literature. He acquired great reputation as a poet, by a collection of pieces in Latin which appeared in 1678, but he was, at the same time, diligent in his profession, as a teacher and director in theology. His poems contain paraphrases on various parts of the scriptures, od s. fabes, epigrams, &c. of which the general character is taciturn, copious, and amity. He is thought to have succeeded his father in his place, but his fables are in high repute. He died at Paris in 1702, leaving behind him the character of an open and upright disposition. An edition of his poems was published in 2 vol. 12mo, in the year 1734. Nouv. Dict. Hist.

**COMMIS, Fr.** A clerk, deputy, or subordinate person, who is employed in any of the war-departments of the French.

**Commiss general du parc des viviers; commis-general of the provision-park.** This officer exercises his functions under the orders of the director-general of provisions. His employment requires a good deal of capacity and zeal, as well as of probity. His duties and relations are multifarious and extensive. He should always encamp in the centre of the bagagg, to be able to have an eye to the whole, and to be left uninterrupted.

**Commiss General des travaux du parc des viviers, commis- general of labour and work in the provision-park.** The duties of this employment are troublesome, and require much attention. It should never be belowed on a man that does not possess experience, prudence, and firmness, without being too rigorous or severe, as he has authority over every thing connected with the different kinds of work in the park.

**Commiss des entrepreneurs pour la fourniture des Ets; clerks of undertakers for the furnishing of beds.** They have a right to visit and examine the beds and every thing connected with them, and to refuse or reject whatever is insufficient or defective.

**Commiss du tresorier de l'extraordinaire des guerres, clerks of the treasurer of the wars, or of the paymaster general of the army.** They deliver the certificates to the troops who leave lodgings or quarters. They were under the jurisdiction of the high comisiable.

**COMMISSIONERATION,** in *Pathology* and *Ethics,* is frequently used as synonymous with *compiission,* which term; but, in its general use, it is somewhat different. It is always preferred, when we wish to express our sympathy for misfortunes, which it is not in our power to remove, or for which there is no apparent remedy. Commissioning, diminishing upon the slate and suffering of others, induces a permanent concern. In such cases it may be said, that we commiserate the
the unfortunate sufferer, rather than that we have compas-
ッション upon him. But although this is a more helpfut, it is
not an ulelefs affection. It ftoths the mind of the afflicted,
and greatly alleviates their fOWors, when every other con-
volution faiis. Condolence is the expression of our commiser-
COMMISSAIRE, Fr. Commiffary. This word or term
was ufed in the old French service, to exprefs a variety of
occupations, and was annexed to a good many different ap-
pellations, of which the following are the principal.
COMMISSAIRE General des Guerres ou commiffaire General
des Armées, commiffary general of the wars. This charge,
office, or appointment, was created for Befangue, in 1637,
and did not long exift, being fupprefsed in his perfon, be-
cause it gave too much authority, and too many privileges,
to the perfon invested with it.
COMMISSAIRE General de la Cavalerie légère. Fr. He was
the third general officer of all the regiments of cavalry,
and he had a regiment of his own under the name of the
regiment of the commiffary general, or commiffary gen-
eral.
COMMISSAIRE Ordonnateur des Guerres. This appointment
was superior to that of an ordinary or provincial commif-
Sary of war. It was communi a fort of reconnoitres and
advancement granted in confideration of services rendered by
the one or the other commiffaries of war, whether of the
armies or in the interior of the state. The commiffary or-
donateur is charged with objects of the firft importance,
and with a greater variety of them than the other commif-
saries are.
COMMISSAIRE des Guerres, commiffaries of the wars, or
muiter-maifers general. They enjoyed peculiar privileges,
but were fubordinate to the governors and commandants of
towns and garrifons, without whom perfon they could not
muiter any regiment.
COMMISSAIRE Ordinaire des Guerres, ordinary commiffaries
of the wars, or deputy-muiter matters. Officers fubordinate
to the immediately preceding, who ought to affift at re-
views, who are charged with the conduct, police, and cli-
dipline of troops, and with making the men obferve the milita-
ry deccres. With the army, they have the detail of the hospi-
tals, bread, victories, &c. &c. They make inventories of pro-
inaries, and are charged with the management of convoys. Their
creation is very ancient: for there is mention made of them
under the reign of King Jenu I. in 1355. They were called at
fril conduiteurs des gens de guerre, (conductors of the people
of war, or of military men) a title or appellation which
they enjoyed for a long time under Louis XIII., and they are
still called fo in their commiffions. Thofe who were not
gentlemen, had the right of taking the rank of fquire, or
esquire; of enjoying all the privileges of the noblefle, and of
acquiring noble fiels.
COMMISSAIRE Provincial des Guerres, provincial commiffary
of the wars. There were no commiffaires provinciaux des
guerres before the year 1655. They were afterwards fupp-
refsed, and were re-callified in 1704, under Louis XIV.,
with the fame privileges, rights, attractions, and authorities
for the fervice of cities of war, that the ordinary commiffaries
of the wars enjoyed for the fervice of marches, and of the
armies.
COMMISSAIRE General des Fiores, commiffary general of
provisions. This officer has under him feveral other commi-
saries, who ought to know the number of men,
which each of them will have to fubfit, in order to
make choice of a proper place for causing the pro-
vifions to be brought to, as also to form magazines for the
duration of the campaign, and of course to procure a suffi-
cient number of bakers and workmen.
COMMISSAIRE d'Artillerie, commiffary of artillery. There is
one fuch officer in each department of the ordnance, who
keeps one of the three keys that belong to the artillery-ma-
gazine. It is at his requisition that the governor or com-
mendant of a place fends folders to remove, when nec-
chary, the pieces of artillery and ftores of war. He has the
superintendence and direction of every thing connected with
the cleaning and general management of the magazines.
COMMISSAIRES provinciaux d'Artillerie, provincial commif-
saries of artillery. These were of two sorts or descriptions.
The one had the names or titles of the provinces; the other
had merely the title of provincial. But on service, they
both received the fame pay.
COMMISSAIRES ordinaires d'Artillerie, ordinary commiffaries
of artillery. These were fubordinate to the provincial com-
miffaries, and were distributed among the forts, garrifoned
towns, navy, and dockyards.
COMMISSAIRES extraordinaires d'Artillerie, extraordinary
commiffaries of artillery. Under the monarchical of France, these
formed the third of ordnance-commiffaries, and they were
in like manner distributed on duty in garrifoned places, and
on board ships of war.
COMMISSAIRE Provincial de l'Arsenal de Paris, au departem-
ent de l'Isle de France, provincial commiffary in the arsenal
of Paris, in the department of the isle of France. This officer
receivcd his commiffion from the grand defanter, in whose
gift it was, and poifefled the exclusive privilege of being
made privy to every alteration or movement that took place
in the arsenal.
COMMISSAIRE General des Poudres et Salpêtres, commiffary
general of gun-powder and saltpetre. This appointment was
created in 1634, with that of superintendent general of
gun-powder and saltpetre. It was at ralt fupprefsed, and
the general matter of the ordnance appointed a perfon to ex-
cerfc its functions.
COMMISSAIRE General des Fontes, commiffary general of
the founderies. This appointment was the gift of the ma-
ter of the ordnance, and was invariablv bestowed on thofe
who had given convincing proofs of their abilities and skill
in the calling of cannon, &c.
COMMISSAIRE des Guerres entrepris dans l'Hôtel des Inva-
lités, commiffaries of war kept in the hotel des invalides.
The was a principal part of their duty to keep a regular roll on
list of all the names of the different officers, non-commif-
sioned officers, and foldiers, that might be detached on garrifon
duty, &c. from which they made a monthly return to the
secretary at war. Each commiffary, at every review or
inspection of the corps of invalids, had particular directions
to mark and point out thofe men who appeared to be ca-
Spable of ferving, of whom a regular return was made to the
secretary at war.
COMMISSAIRE General des Fortifications, commiffary ge-
eral of fortifications. This was an office of great im-
portance, as it was his duty to give the plans for places and
new works; to approve or condemn thofe that had been or-
dered by others; to visit the fortified places of the king-
dom; to order the repairation of works that had been di-
maged; to regulate the conduct of the engineers, and to
give them orders for the good of the service.
At a siege, he directed the tracing out of the lines of
circumwallation and counterwallation, and the fecturing of
the polls; he decided on attacks which were made accord-
ing to his plan; he directed the making of lodgments, lappes,
mines, the traverse of the ditch, the attack of the breach,
and after the place was taken, caused it to be repaired. In defending a place, he had the fame or equal power. His appointments amounted to about 30,000 livres per annum.

COMMISSARY, in Military Language of Britain, has various denominations, though he is generally a civil officer appointed to inspect the munitions, stores, and provisions for the army. The number of such officers is not limited in time of war. Commissaries general, and commissaries of accounts, in our service, are appointed by warrant under the king's sign manual, directing them to obey all directions given to them for the execution of their duty by the lords commissions of the treasury. These instructions are generally prepared by the comptrollers of the army-accounts, under the orders of the treasury, and subject to its subsequent inspection.

COMMISSARY General of the Mufters, or Muftar-mater general. This officer takes as an account of the strength of every regiment as often as he pleases; reviews them; sees that the horses are well mounted, and that all the men are well armed and clothed. He receives and inspects the mutton-rolls, and thereby knows exactly the strength of the army. A new officer has been appointed under the application of Inspector-general of Carriages, who performs the duties in that respect, which used to be performed by the munter mater general.

COMMISSARY General of Stores. A civil officer who has charge of ordnance stores, on which he is also accountable to the office of ordnance. He has other commissaries under him, as well as clerks and conductors, particularly in time of war.

COMMISSARY of the Train-horses. A civil officer of the ordnance, who has the inspection of all horses belonging to the train of artillery, the hospital, and the bakery. He has a number of conductors, drivers, &c. under him.

COMMISSARY of Accounts. A person of responsibility, who, with a proper establishment, attends as many armies, sufficiently large and numerous, to render it necessary for the purpose of taking, examining, and controlling accounts on the spot. All such commissaries make returns of their examinations, on which, as documents, the comptrollers of the army-accounts ground their inquiries into that branch of the public expenditure.

COMMISSARY General of Provifions. An officer who is charged with furnishing the army in the field and on service, with all sorts of provisions, forage, &c. generally by contract, and sometimes otherwise. He has a variety of commissaries, store-keepers, clerks, &c. under him.

COMMISSARY, in the Ecclesiastical Law, an officer of the bishop, who executes ecclesiastical jurisdiction in those parts of the diocese, which are so remote from the see that the chancellor cannot call the subjects thereof to the bishop's principal curia, without their too great molestation.

This officer, called by the canons commissarius, or officialis foratus, is appointed to supply the bishop's fice in the out-parts of the diocese, and in such parts as are peculiar to the bishop, and exempted from the jurisdiction of the archdeacon: for where the archdeacons have jurisdiction, as in most places they have, either by prescription or composition, the commissary is supefluous, and frequently vexatious, and ought not to be: yet in such cases, a commissary is sometimes appointed by the bishop, and takes prelummary of the archdeacon yearly pro exteriores jurisdictions, as it is ordinarily called. But this is held to be a wrong to archdeacons and the poorer sort of people. Cawel's Interp. 4. Int. 3. 8.

COMMISSARY Court, in Scots Jurisprudence. At the reformation, all episcopal jurisdiction exercised under the authority of the bishop of Rome was abolished, and the course of justice in ecclesiastical causes was thus stopped. Hence Queen Mary, besides naming a commissary for every diocese, did, by a special grant, establish a new commissary court at Edinburgh, consisting of four judges or commissaries. This court is vested with a double jurisdiction; one diocesan, which is exercised in the diocesan territory contained in the grant, viz., the counties of Edinburgh, Haddington, Linlithgow, Peebles, and a great part of Stirlingshire; and another universal, by which the judges confirm the sentences of all who die in foreign parts, and may reduce the decrees of all inferior commissaries, provided the reduction be pursued within a year after the decree. Bishops, upon their re-establishment in the reign of James VI., were restored to the right of naming their several commissaries. The commissaries retain to this day an exclusive power of judging in declarations of marriage, and of the nullity of marriage; in actions of divorce and of non-adherence, of adultery, bastardy, and confirmation of testaments; because all these matters are still considered to be properly confessional. Inferior commissaries are not competent to question divorce, under which are comprehended questions of bailiary and adherence, when they have a connection with the lawfulunts of marriage, or with adultery. Commisaries have now no power to pronounce decrees in absence for any sum above 40l. Scots, except in cases purely confessional; but they may authenticate titles and curatorial inventories; and all bonds, contracts, &c. which contain a clause for registration in the books of any judge competent, and protests on bills, may be registered in their books.

COMMISSION in Common Law, is the same with diarchy among the civilians, and is taken for the warrant, or letters-patent, which all persons exercising jurisdiction, either ordinary or extraordinary, have to authorize them to hear or determine any cause or action: such as the commission of judges, &c.

The term, however, is sometimes extended farther than to matters of judgment; as in the commission of purveyors, which seems to be only by the statute for taking away purveyance, 12 Car. II. and the high commissary court, which was founded in the statute 1 Eliz. and is also abolished by act of parliament at 16 Car. I. The persons charged with a commission are hence called commissaries or former times commissaries.

Commissaries of inquiry shall be made to the justices of oaths, or the other, &c., and to do lawful things are granted in many cases. Most of the great officers, judicial and ministerial of the realm, are made by commissaries. And by such commissaries, treasons, felonies, and other offences, may be heard and determined: by this method, brethren, oaths, cognizances of fines, and answers, are taken, warrants examine, &c. See Ab. 12. 1. c. 59. See flat. 42. E. III. c. 4. Most of these commissaries are appointed by the king under the great seal of England; but a commissary under the great seal may be determined by a privy seal; and by granting another new commission to do the same thing, the former commission determines; and on the death or demise of the king, the commissaries of judges and officers generally cease. See Commis. 2 Decr 289.

COMMISSION of Anticipation, was anciently a commission given under the great seal, to collect a tax or subsidy before the day. 15 Hen. VIII.

COMMISSION of Array. See MILITIA.

COMMISSION of Affidavit, is a commission under the great seal to allocate two, or more learned persons, with the several justices, in the several circuits and counties in Wales.

COMMISSION of Bankruptcy, a commission under the great seal,
CQM

feal, directed to five or more commissioners, to inquire into
the particulars of a man's circumstances, who hath tailed,
or broke; and to act according to certain statutes existing
in that behalf. See Bankrupt, and Petition of Bank-
ruptcy.

Commission of Charitable Uses go out of the chancery
of the bishop and others, where any lands given to char-
able uses are unemployed, or there are any fraud or dis-
putes concerning them, to inquire of and redress the abuse,
&c. 43 Eliz. cap. 3.

Commission of Delegates, a commission under the great
seal to certain persons, usually two or three temporal lords,
as many bishops, and two judges of the law, to sit upon
an appeal to the king in the court of chancery, where any sen-
tence is given in any ecclesiastical cause by the archbishop.
Stat. 35 Hen. VIII. c. 19. Now generally three of
the common law judges and two civilians sit as judges. See
Court and Delegates.

Commission to enquire of faults against the laws, an
ancient commission set forth on extraordinary occasions
and corruptions.

Commission of Lunacy, a commission out of chancery
in the care of his effate, &c. 17 Edw. II. c. 10.

Commission of Peace. See Justice of Peace.

Commission of Rebellion, or Writ of Rebellion, is issud
out when a man, after proclamation made by the sherif
upon a proceed out of the chancery, to present himself,
under pain of his allegiance, to the court by a certain day,
doing appear. See Rebellion.

This commission is directed by way of command to certain
persons; three, two, or one of them, to apprehend, or canle
be apprehended, the party as a rebel; and to bring him
to the court on a day assigned.

This writ or commission goes forth after an attachment re-
turned, non est inventus, &c.

Commission of Sewers, is directed to certain persons
to see drains and ditches well kept, and maintained, in
the marshy and fenous parts of England, for the better convey-
ance of water into the sea, and preserving the grazing
of the land. Stat. 6 Jac. I. c. 14. ordains, that all ditches, water-courses,
&c., within two miles of London, falling into the Thames,
shall be subject to the commission of sewers; and the lord-
mayor, &c., is to appoint persons who have this power.

Commission to examine witnesses, is sometimes appointed
by the court of equity in cases that require it, as when the
cast ances in a foreign country, and the witnesses are at
home, or when the witnesses are abroad, or soon to leave the
kingdom; or again, when they are aged and infirm.
This commission is empowered to exercise the same jurisdiction
as would have been exercised if the witnesses had at-
tended. See Suit.

Commission of Treaty with Foreign Princes, is where
leagues and treaties are made and transacted, between nations
and kingdoms, by their ambassadors and ministers, for the
mutual advantage of the kingdoms in alliance.

Commission to take up Men for War, was a commission
to pref or force men into the king's service. This power of
impressing has been heretofore doubted; but the legality
Com. r. 419. Comw. 517. See Impress.

Commission, Military. A brevet, or power, granted
in writing by the minister of war in the name of the sove-
reign, and sealed with the great seal, by which he, to
whom it is given, is authorized to the military charge commuted
in him, and who is to draw from the day of the date thereof.
Commission in military cases, in our laws, denotes any situta-
tions or places, which an individual may hold in the
regular army, militia, or volunteers. All commissions in
the line, guards, or volunteer-corps, must have the royal sign
manual. Commissions however in the militia do not bear the
royal sign manual, except that of the adjutant-general, who is
commonly called a king's officer. The lieutenants or
captains-lieutenants of counties affix their seals and signatures
to militia-commissions after they have been laid before the
king for his approbation. Fourteen days constitute the
time allotted for the royal approbation or disapprobation.
And if his majesty does not within that time disapprove
of the person to recommended, a notification of his pleasure
and acquiescence is left by one of the principal secretaries
of state to the lord lieutenant, or to those acting by com-
mussion in his absence.

Commission Military is also a momentary or temporary
tribunal appointed or ordered to sit for the trial of military
offences and crimes. When judgment is pronounced and
the duty is performed, for which it was appointed, its
authority, as well as its existence, ceases.

Commission of Array. Commissions issued to expe-
rienced officers to draw out and array the fitted men
in each county for service, and to march them to the
coasts, or to such other parts of the county as were thought
to be most in danger. There were hundreds of such com-
misions between the 36th of Henry III., and the reign
of Edward IV. The form of one is to be seen in "Rut-
worth's Historical Collection," published in 1642. Such
commissions were attempted to be revived by Charles
II., but they were voted illegal and unconstitutional by the
Parliament.

Commissioned is a term commonly employed to
designate a class of men, who, between the rank and file
of a battalion, and the commissioned and warrant officers,
are serjeants-major, serjeants for fatigue.

Commission Officers. See Officer.

Commissions, Book of. See Book.

Commission in Commerce. See Factorage.

COMMISSIONER, he who has a commission, cr. pr. a
patent, or other legal warrant, to execute any public
office. See Warrant, &c.

Such are, commissioners of hawkers and pedlars, commis-
sioners of alienation, commissioners of the flamps, &c.

Commissioners of Public Accounts. See Accounts.

Commissioners of the Customs. See Customs-house.

Commissioners of the Dock-yards. See Dock-yards.

Commissioners of Excise. See Excise.

Commissioners of the Navy. See Navy.

Commissioners, Lords, of the Treasury. See Treasury,
and Exchequer.

Commissioners of Trade, &c. See Board.

COMMISSUM Factore. See Factore.

COMMISSURE, a term used by some
authors for the junctures, or for the small interstices
of bodies; or the little clefts between the particles; espe-
cially when those particles are broad or flat, and lie contiguous
to one another, like thin plates, or lamelles.

The word literally signifies a joining, or connecting of
one thing to another.

COMMISSURE, in Architecture, &c. denotes the joint of
two plates; or the application of the surface of the one to
that of the other.
COMMISSURE. 

COMMISSURE Cordis, in Anatomy, are parts of the brain, which join together the right and left sides of this viscus.

There are three of these commissures: an anterior one which is directly under the anterior crura of the fornix; a posterior, which is behind the optic thalamus, and in front of the tuber cinereum; and a middle one, which joins together the opposed convexities of the thalami nuclei corporis quadrigeminarum.

For a further description of these parts, see Brain.

COMMITMENT, in Law, the lodging of a person to prison by warrant or order, who hath been guilty of any offence not bailable, or for which bail is refused. It may be by the king and privy council, or by the judges of the peace, and other magistrates, who have authority by the laws and statutes of the realm to do it, which must be exactly pursued.

As to the manner of commitment, it is enacted by 2 & 3 P. & M. c. 57, that justices of peace shall examine persons brought before them for felony, &c., or sufficition thereof, before they commit them to prison, and shall bind their accusers to give evidence against them. A justice of the peace may detain a prisoner for examination, and it is said that three days are a reasonable time for this purpose.

2 Hawk. P. C. c. 16. § 11, 12. 3 Leis. c. 125. 2 Inst. 52, 591.

Every commitment must be in writing, under the hand and seal, and shew the authority, of him that made it, and the time and place, and must be directed to the keeper of the prison. It may be either in the king's name, and only signed by the justice, or in the name of the justice. It may command the gaoler to keep the party in safe and close custody, which he is bound by law to do. 2 Hawk. P. C. c. 16. § 13, 14, 15. It ought to set forth the crime with convenient certainty, whether the commitment be by the privy council, or by any other authority: otherwise the officer is not punishable by reason of such imputum, for sufficing the party to escape; and the court before which he is removed, by Habeas-corpus, ought to discharge or bail him; and this holds not only where no cause at all is expressed in the commitment, but also where it is so loosely set forth, that the court cannot judge whether it were a reasonable ground for commitment or not. 2 Hawk. P. C. c. 16. § 17. See ARREST AND BAIL. A commitment for high treason or felony in general, without expressing the particular species, has been held good. (2 Hawk. P. C. c. 16. § 16.) But now, since the Habeas-corpus act, it feems that such general commitment is not good. Moreover, it is safe to set forth that the party is charged upon oath; but this is not necessary, for it hath been resolved, that a commitment for treason, or for sufficition of it, without setting forth any particular accusation or ground of the sufficition, is good. 2 Hawk. P. C. c. 16. § 17. Every such imputum ought to have a lawful conclusion, viz., that the party be kept till he be delivered by law, or by order of law, or by due course of law; or that he be kept till further order (which shall be intended of the order of law) or to the like effect; and if the party be committed only for want of bail, it feems to be a good conclusion of the commitment, that he be kept till he can find bail: but a commitment till the person who makes it shall take further order, feems not to be good: and it feems that the party committed by such or any other irregular imputum, may be bailed. 2 Hawk. P. C. c. 16. § 18.

A commitment grounded on an act of parliament ought to be conformable to the method prescribed by such statute. Where a man is committed as a criminal, the conclusion must be, "until he be delivered by due course of law;" if he be committed for contempt, it should be "until he comply."

All commitments must be to some prison within the realm of England; for by the Habeas-corpus act (c. 31 Car. II. cap. 2.) it is enacted "no subject of this realm, being an inhabitant or refugee of this kingdom of England, dominion of Wales, or town of Berwick-upon-Tweed, shall or may be sent prisoner into Scotland, Ireland, Jersey, Guernsey, Tangier, or into any parts, colonies, places, beyond the seas, which then were, or at any time after should be, within or without the dominions of his majesty." By § 14 Ed. III. c. 10, sheriffs shall have the custody of the gaol as before that time they were wont to have, and they shall put in such under keepers for whom they will answer. This is confirmed by § 19 Hen. VII. c. 10. It hath also been held, that regularly no one can justify the delivering of a prisoner in custody out of the common gaol, unless there be some particular reason for so doing, as sickness endangering life, or evident danger of a recusant from rebels, &c.: nevertheless continuance practice seems to authorize a commitment to a meffenger; and it is said, that it shall be intended to have been made in order for the carrying of the party to gaol. 2 Hawk. P. C. c. 16. § 8, 9. And it is said, that if a contable bring a felon to gaol, and the gaoler refuse to receive him, the town where he is contable ought to keep him till the next gaol delivery.

H. P. C. c. 114. 2 Hawk. P. C. c. 16. § 9. A prisoner in the custody of the king's meffenger, or on a warrant from the secretary of state, who is brought into K. B. by Habeas-corpus to be bailed, but has not his bail ready, cannot be committed to the same custody, under which he came; but must be committed to the custody of the marshal, which will prevent the necessity of putting out a new Habeas-corpus; as he may be brought up from the prison of the court, by a rule of court, whenever he shall be prepared to give bail. 1 Burr. 460. If a person arrested in one county for a crime done in it, fly into another county, and be retaken there, he may be committed by a justice of the first county to the gaol of such county. (H. P. C. 93.) But by the better opinion, if he had, before any arrest, fled into such county, he must be committed to the gaol thereof by a justice of such county. 2 Hawk. P. C. c. 16. § 8. 3 Dale. c. 118. It feems also to be laid down as a rule by some books, that any offender may be committed to the gaol next to the place where he was taken, whether it be in the same county or not. 2 Hawk. P. C. c. 16. § 8. By § 6 Geo. I. c. 19, vagrants and other criminals, and persons charged with small offences, may, for such offences, or for want of bail, be committed either to the common gaol or house of correction, as the justices shall think proper. By § 2, Geo. II. c. 55, if a person is apprehended, upon a warrant indorsed, in another county, for an offence not bailable, or if he shall not there find bail, he shall be carried back into the first county, and be committed, or if bailable, bailed by the justices in such first county.

With respect to the charges of commitment, it is enacted by § 3 Jac. I. c. 10, that offenders committed are to bear their own charges, and the charges of those who are appointed to guard them; and, if they refuse to pay, the charges may be levied by sale of their goods. And by § 27 Geo. II. c. 3, if they have no goods, &c., within the county where they are apprehended, the justices are to grant a warrant on the treasurer of the county for payment of their charges. But in Middlesex
Witness the same shall be paid by the overseers of the poor of the parish where the person was apprehended. By act 3 Hen. VII. c. 3, the sheriff shall certify the names of all prisoners in his custody to the judges of gaol delivery.

Prisoners, committed at first to the proper prison, ought not to be removed thence, except in some special cases; and in peculiar circumstances, specified by 31 Car. II. c. 2. A person, legally committed for a crime, which certainly appears to have been done by one or other, cannot be lawfully discharged by any other but the king, till he be acquitted on his trial, or have an ignorant found by the grand jury, or none to prosecute him on a proclamation for that purpose, by the judges of gaol-delivery. But if a person be committed on a bare suspicion, without any appearance of guilt, or indictment, for a supposed crime, when afterwards it appears there was none; as for the murder of a person thought to be dead, but afterwards found to be alive, it hath been held that he may be falsely dismissed without any farther proceeding. 2 Hawk. P. C. c. 16. § 23. But the safest way for the gaoler is to have the authority of some court, or magistrate, for discharging the prisoner. If the words of a statute are not pursued in a commitment, the party shall be discharged by Has. 31. G. 33. Jacob's Law Dict. by Tomlin. See Arrest, Bail, Imprisonment, Mitigation, &c.

COMMITTEE, in Law, one or more persons, to whom the consideration of any matter is referred, either by a court, or by consent of the parties concerned.

Committee of Parliament, is a board consisting of a certain number of members, appointed by the whole house for the examining of a bill, or making report of an inquiry, or proofs of the house, &c.

Sometimes the whole house is resolved into a committee; on which occasion each person has a right to speak, and reply as much, and as often as he pleases; an expedient they usually have recourse to in extraordinary cases, and where any thing is to be thoroughly canvassed. When the house is not in a committee, each gives his opinion generally, and is only allowed to speak once, unless to explain himself.

The standing committees, appointed by every new parliament, are those of privileges and elections, of religion, of grievances; of courts of justice, and of trade, though only the former sec. See Parliament.

Committee of the king, is used for a widow of one of the king's tenants; thus called, as being by the ancient law of the realm committed to the king's care and protection.

See Widow.

Committee of a Lunatic, idiot, &c. denotes the person to whom the care and custody of such lunatic, &c. is committed by the court of chancery. See Lunatic.

Committees of Corporations, &c. are such members who perform the general routine of business. See Corporations.

COMMODATE, Commodatum, in the Civil Jurisprudence, the loan or free concession of any thing movable or immoveable, for a certain time on condition of reverting again the same individual after a certain term.

The commodity is a kind of loan; there is this difference, however, between a loan and a commodity, that the latter is gratis, and does not transfer the property: the thing must be returned in effeuce, and without impediment; so that things which confine by use, or time, cannot be objects of a commodity, but of a loan; in regard they may be returned in kind, though not in identity.

COMMODAVIENSIS, an appellation given by some authors to a species of Iphis calamariae found in Bohemia.

But as it yields no zinc, Mr. Marggraf denies it to be true calamite.

COMMODORES. See Staple.

COMMODORE, in the British Navy, a general officer invested with the command of a detachment of ships of war detailed on any particular enterprise; during which time he bears the rank of a brigadier-general in the army, and his ship is distinguished by a broad red pendant tapering towards the outer end, and sometimes forked.

COMMODORE is also a name given to a select ship in a fleet of merchantmen, which leads the van in time of war, bearing a light in her top to conduct the fleet.

COMMUDUS, Lucius Aurelius Antoninus, in Biography, was the only son of the emperor Marcus Antoninus and Faustina, and born A.D. 161. He was educated with the utmost attention, and he enjoyed very superior advantages from the precepts and instructions of tutors appointed to preclude over his infantile studies and pursuits; but from the first openings of his mind, he displayed an untoward disposition, and a strong propensity for low and unworthy gratifications. He discovered an aversion from whatever was rational or useful, and a fond attachment to the sports of the cisterns, the combats of gladiators, and the hunting and destroying of wild beasts. To wean him from these pursuits, and with a view of engaging his mind in useful and manly occupations, his father made him a partaker of the sovereign power in his fifteenth year. This instance of parental affection did not produce the desired effect; it only furnished him with better opportunities of indulging every licentious gratification. Upon the death of Marcus, in the year 180; he succeeded to the quiet and undisputed possession of the throne; he law about him neither competitor to remove nor enemies to punish, and during the first three years of his reign, the influence of his father's virtuous counsellors restrained him from any acts of tyranny towards his subjects. During this period, however, he indulged in every species of licentiousness, and revelled in all the licence of sovereign and unrestrained power, but his hands were unstained with blood, and occasionally he displayed a generosity of sentiment worthy of a great mind; he had in one instance refused to see the proofs of a conspiracy formed against him, and it was hoped he might have followed the track of his illustrious father. A fatal incident decided his fluctuating character. An assassin was employed to destroy him; in making the attempt he explained "the senate sends you this." The deed was prevented, and Commodus from that hour encouraged a deep-rooted hatred for the whole body of senators. Spies and informers increased his suspicions and excited his jealousy of power in any other hands than his own. Accusation was regarded as proof, and the mockery of a pretended trial led only to certain condemnation. The execution of any considerable senator was ever attended with the death of all those who should attempt to revenge, or publicly dare to lament his fate, and when Commodus had tainted of human blood, he became incapable of pity or remorse. His ministers were one after another the victims of his fears or of his cruelty. Perennis was condemned to die for a charge of aspiring to the empire, and after his death the conduct of Commodus assumed the appearance of virtue. He repealed the most odious of his minister's acts, loaded his memory with public executions, and ascribed to his pernicious counsellors, all the errors of inexperienced youth. But his seeming repentance lasted only a short month, and then every sentiment of humanity appeared to be obliterated from his breast. He abandoned the reins of government to the most unworthy, and he valued nothing in sovereignty, except...
except the usual indulgence in indulging his indulgent appetites. Histories were spent in a rhapsody of bawdy women and boys, selected from all ranks of the people, and toms every province of the empire. The intestines of but were filled up with the half-felt amusements. The servile crowd, whole fortune depended on their monarch's voice, applauded these vile perfumes. Having by long practice attained great skill in the use of the bow, he exhibited his talents before the people, and animals of the rarest species were collected from the remotest part of his dominions in order to serve as marks for the spectated archer. The pernicious voice of flattery reminded him that by exploits of the same nature, the Grecian Hercules had acquired a place among the gods, and an immortal memory among men. He accordingly assumed the title and insignia of Hercules; in this character he exhibited all the helpmens and dismayed of the city, and causing them to be wrapped up in fantastical habits, like dragons and mulehers, and armed with sponges instead of stones, he rushed upon them with his club and laid them all dead at his feet. He exhibited himself more than 500 times in the character of a slaver, and in all his combats he was victorious, but his amusements in this way were frequently fatal to his antagonists. It would take more of our work than can be allotted to this article to describe all the cruelties and acts of savage barbarity which disgraced the reign of Commodus. At length his detestable career came to its mentor end. Opposition to his bloody deluges was given by some of his bolom counsellors, among whom was Marcia, his favourite confederate. He resolved to put them to death, and entered their names in a long list defined to the same fate. Marcia discovered his intentions, and apprized her friends of their common danger. They resolved to anticipate the blow, and Marcia mixing some poison in wine, presented it to him as he came from the bath. He soon fell asleep, but the dose not being sufficiently strong, he awake; while, however, he was labouring under the effects of the poison, a robust youth, by profession a wrestler, entered his chamber, and strangled him without resistance. The body was secretly conveyed out of the palace, before a funeral was entertained either in the city or the court of the emperor's death. Such was the fate of Commodus, and "so faly," says the historian, "was it to destroy a tyrant, who, by the artificial powers of government, had oppressed, during thirteen years, so many millions of subjects, each of whom was equal to their master in personal strength and personal abilities." Gibbon.

COMMOIGNE, in Law, a word signifying a fellow-mosaic, that lives in the same convent. 3 Bl. 15.

COMMON, in Agriculture, an open piece of ground, made use of equally by different persons who occupy lands in the parish to which it belongs or in which it lies.

It is remarked by Mr. Marshall in his "Treatise on Landed Property," in regard to the origin of commonable lands, "that a very few centuries ago, nearly the whole of the lands of England lay in an open, and more or less in a commonable state. Each parish, or township, (at least in the more central and northern districts) comprised different descriptions of lands; having been fued, during successive ages, to specified modes of occupancy, under ancient and strict regulations, which time has converted into law. These parochial arrangements, however, varied somewhat in different districts; but, in the more central and greater part of the kingdom, not widely. Under this ingenious mode of organization, each parish or township was, he says, considered as one common farm, though the tenantry were numerous. Round the village in which the tenants resided lay a few small inclosures or plat yards for rearing calves, and as baiting and muniting grounds for other farm stock. This was the common farmstead or bungfel, which was generally placed as near the course of the more cultivated lands of the parish or township as water and shelter would permit. And that "round the homestead lay a suit of arable fields, including the deep and boundless of the lower grounds, situated out of the water's way, for raising corn and pulse; as well as to produce fodder and litter for cattle and hawks in the winter season." While in the lowest situation, as in the water-reformed base of a rivered valley, or in swampy dips, shooting up among the arable lands, lay an extent of meadow grounds or inges, to afford a supply of hay for cows and working flock, in the winter and spring months.

That on the outskirts of the arable lands, where the soil is adapted to the purlieus of cattle, or on the springy slope of hills, less adapted to cultivation, or in the sandy leazes of valleys, which were tunnel or gravelly water-formed lands, which were too dry to produce an annual supply of hay with sufficient certainty, one or more ighted fylons, or homesteads, were laid out, for milking cows, working cattle, or other flock which required superior purlieus, in summer.

While the b caked, word-foiled, and most distant lands of the township were left in their native wild state, for timber and fuel, and for a common fylon, or suit of purlieus, for the more ordinary flock of the township, whether horses, rearing cattle, sheep or swine, without any other stint, or reflection, than what the arable and meadow lands indirectly gave; every joint tenant, or occupier of the township, having the nominal privilege of keeping as much live flock on these commons, in summer, as the appropriated lands be occupied would maintain, in winter.

Further, that the appropriated lands of each township were laid out with equal good fence and propriety. That each occupier might have his proportionate share of lands of different qualities, and lying in different situations, the arable lands more particularly were divided into numerous parcels, of sizes, doublets, according to the size of the given township, and the number and rank of the occupiers.

And that the whole might be subjected to the same plan of management, and be conducted as one common farm, the arable lands were moreover divided into compartments, or "fields," of nearly equal size, and generally three in number, to receive, in constant rotation, the triennial succession of fallow, wheat (or rye), and spring crops, (as barley, oats, beans, and peas), thus adopting and promoting a system of husbandry, which, howsoever improper it is become in these more enlightened days, was well adapted to the state of ignorance and villagile of feudal times, when each parth or township had its sole proprietor; the occupiers being at once his tenants and his fielders, or maner writhe. The lands were in course liable to be more or less deferted by their occupiers, and left to the freetailed of the young, the aged, and the weaker sex. But the whole township being, in this manner, thrown into one system, the care and management of the live flock at least would be easier and better than they would have been under any other arrangement. And at all times, the manager of the estate was better enabled to detect bad husbandry, and enforce that which was profitable to the tenants and the estate, by having the whole spread under the eye at once, then he would have been had the lands been distributed in detached inclosed farneata, besides avoiding the expense of inclosure. And another advantage, he thinks, arose from this more social arrangement: in barbarous times the tenants, by being concentrated in villages, were not only better situated to defend each other from predatory atta,
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But where the common is unfenced; or in other words, where the farmers possess right of pasturing any number and species of live stock which they choose to feed, and without restraint of any kind, the value of such right is confirmed by many farmers in inconsiderable as not to be worthy of their attention. Such farms as possess improved troops of horses, cattle, and in ep. felde, indeed, if ever, are convenient to some neighbouring farmers or drovers, who have no objection, in the view of profit, of running the risk of their cattle meeting with accidents, or being infected with disease, as much naturally be expected to happen on these extensive commons, where so many cattle are promiscuously collected together.

It has been remarked by a late able writer, that "the commons in Middlesex, as in most other places, are three fourths of them covered with heath and furze, from which a little of the worse sort of firing is obtained by the poor. The trifling quantity of food which cattle consume from these shrubs, does not, and indeed cannot, improve them, as it is barely sufficient to keep them from starving. Much of the remainder is occupied by roads, gravel pits, and ponds, yielding nothing. After the mott mature consider of, he is inclined to think, that about 4,500 acres of the commons in the above county are employed in the production of grass for the feeding of cattle, affording indeed but a miserable pasturage, as the greater part is under water during winter; and, from being poached and trodden down by cattle while wet, is rendered hard, lumpy, full of holes, and parakes of the thriftiness of manuring during summer. The grass is mostly of the dwarf kind, and of scanty produce, with a large proportion of the carnation and other grasses which are known to be rather more dangerous than nourishing; so much so, as to induce some of the most observing farmers in various parts of the kingdom, possessing extensive common rights, after a fair trial to refrain altogether from turning their cattle on such commons.

On such authority it may well be, he says, be questioned, whether commons are of any more use to the community than they would be were they confined to the bottom of the deep. But without attempting the solution of such a question at present, he may be allowed to observe, that the value of commons, considered solely as to their power of increasing animal food, and as totally unconnected with the adjoining inclosures, is extremely small indeed. But when considered as affording an opportunity to the neighbouring farmer to turn his flock out, at certain seasons of the year, they become an object of some importance. For in the spring quarter of the year, by receiving the flock during these months, the growth of hay is encouraged, they answer the purpose of pâturage, and the farmer is thereby enabled to mow all his grass land: which must sensibly increase the quantity of hay to be sent to market; as at Finchley and Harrow, and in this county; or being applied during the winter months to the support of a greater quantity of live stock in places more distant from a good hay-market; and in others, for the purpose of folding on the arable land."

It is further stated, that "on estimating the value of the commons in the same county, including every advantage that can be derived from them in pâturage, locality of situation, and the barbarous custom of turnip, it appears, he says, that they do not produce to the community, in their present state, more than four shillings per acre! On the other hand, they are, in many instances, of real injury to the public, by holding out a lure to the poor man for procuring the means of materials..."
The benefits and advantages that would be derived from a general inclosure of commons, are, he thinks, so numerous, as far to exceed his powers of description or computation. The opportunity it would afford of separating dry ground from wet, of well draining the latter, and liming the rotten parts, is of infinite consequence; as such an arrangement would, with the aid of intelligent breeders, be the means of raising a breed of sheep and neat cattle far superior to the present race of wretched half-starved animals now seen in such situations. It would have the effect of supporting a more numerous flock upon the same quantity of food by repressing the cattle and sheep within due bounds. Their refuse and rambling disposition not only tramples the grass off the ground, but also takes the drift off their bones. This renders the attendance of a shepherd necessary, and requires likewise that they may be driven to and from the fold. Further, the live-flock would by this means be rendered many hundreds per cent. more valuable to individuals and the community than it has hitherto been, or can possibly be, without inclosure; and, what is of the last, the greatest importance, it would tend to prefer such improved breeds from that deplorable malady, the (rot) which makes such terrible havoc among our fleeks. Add to this, that the markets would be more plentifully supplied with beef and mutton, and the price of these articles considerably reduced.

It does not, he says, appear necessary to state with precision (nor indeed is it capable of being so stated) what would be the encrease or value of the commons of this country on their being inclosed and well and properly cultivated. It may, however, with safety be stated at upwards of 15 times their present value to the proprietors, and 40 times their present value to the public. But increasing the rental of such land to 15, or perhaps 20 times, its present amount, is by no means the greatest advantage that may be expected to result from an inclosure of commons. The general salubrity and healthfulness of the country would essentially be improved, while industry would be largely encreased among the most useful classes of society, beggary and robbery much lessening, and the general stock of corn and cattle almost inconceivably augmented. And wherever inclosures are made with due attention to the interest of the poor (as they ought always to be), they will be found to ameliorate their condition, as much as they increase the property and the comforts of the rich.

It is further observed, that "the commons of this kingdom being, with very few exceptions, without ridges, furrows, or drains, have not the means of discharging that superfluous water from the surface of them, which is well known to be of great detriment to vegetation in general.

Many commons in low situations, and where the soil happens to be of a retentive quality, hold water like a sponge, which being always flagrant, as well as excursive in quality, renders the soil of such commons much too wet for the pasturage of sheep, and is, no doubt, the cause of many of the disorders which that animal is subject to, particularly that fatal malady, the rot. From the same cause, also, the neighbourhood of most commons must be particularly unfriendly to the health and longevity of man. Only let us, says he, reverse the scene, and for a moment suppute these commons to be inclosed, the necessaries ditches and drains sunk, and the land brought into tillage, and we shall see all the superabundant moisture got rid of; and the water, being kept in constant motion, by trickling down the sides of the ridges into the furrows, and from thence into the ditches and rivulets, will be found to fertilize the very soil which in its present flagrant state it serves to injure;
injure; while, by leaving the land dry, it will be rendered more healthy both for men and cattle. The effects of such a measure would soon shew themselves in many districts of this island, which, at present, are very unpropitious to the health of man, in the much greater longevity of the inhabitants. It may also be further noticed, that commons are entirely defective in the great article of labour; but no sooner does an inclosure take place, than the scene is agreeably changed from a dreary waste, to the more pleasing one of the same spot, appearing all animation, activity, and bustle. Every man, capable of performing such operations, is furnished with plenty of employment, in sinking ditches and drains, in making banks and hedges, and in planting quicks and trees. Nor are the wheelwright, carpenter, smith, and other rural artificers, under the necessity of being idle spectators of the scene, since abundance of work will be found for them, in the creation of farm houses, and the necessary appendages thereto; and in the forming and making of roads, bridges, gates, files, implements of husbandry, &c. Even after a few years, when this kind of temporary exertion is over, by the whole being brought into a regular syrum of husbandry, it will still continue to provide both food and employment for a very increased population.

"It is highly probable, he thinks, that if the legislature should pass an act for the general inclosure of waste land, it would increase the quantity of rural labour so much as to advance its price considerably, and thereby have the good effect of drawing a vast number of hands out of the unwholesome confinement of manufactories; where, in addition to the life-shortening effects of such confinement, the morals of the people are exposed to certain contamination."

With respect to the effect produced by inclosures on the population of the country, it may be observed, that the inclosing of 1000 acres in any one parish would probably require 100 different labourers, many of whom would undoubtedly be drawn from such of the adjoining parishes as had less work than workmen. Thus it must follow, that the neighbouring towns and villages would diminish, just as much as the parish in which the inclosure is going forward, would increase its numbers; yet the amount of the community will evidently be the same. But although the inclosing of waste land certainly does not immediately either increase or lessen population, as some writers seem to have supposed, yet, that inclosures ultimately affect population, and that as to its increase, in such a manner as the district is thereby made more conducive to health, is, he says, sufficiently evident. Every thing that has a tendency to make a nation more healthy and productive, must, of necessity, operate as a stimulus to population. The certainty of a man's being able, with ease and comfort, to provide for himself and family, by the increase of rural labour, is at once an inducement to marriage, and a consequent increase of population.

The inhabitants wholly supported by agriculture in England and Wales, appear, the same writer says, to be nearly, or perhaps quite, six millions, (while it supplies provisions for near two millions more,) or one to every five acres and a half of cultivated soil. The estimation is made in this manner.

**Estimate.**

| Cultivators of farms, fix persons to every 100 acres, is | 2,340,000 |
| Ditto of gardens, hop-grounds, nurseries, &c. | 300,000 |

Smiths, wheelwrights, bricklayers, masons, carpenters, painters, plumbers, glaziers, various manufacturers of furniture, woollen cloth, and making it up, linen, and making it up, leather, and making it into shoes, boots, &c. hats, hams, and saddlery; as many of each of this description of persons, as are wholly employed by the cultivators of the soil; men, women, and children, about seven persons to each farm, of 100 acres, is 2,800,000

The like of millers, bakers, maltsters, brewers, dressers, fashions, makers, dealers in corn, and persons employed in the commerce of corn - 500,000

The landlords of farms - 49,000

Perfons supported by taxes on the produce of land - 120,000

Not but that the extremes vary much, as there are some few grazing farms, with only one soul to fifty, and arable farms that are peopled in the proportion of one person to three acres of land. In point of produce, the commons, in their present state, apparently, though, he thinks, not rationally afford entire support to human beings, in the proportion of one to an hundred acres. But by being inclosed, and brought into the present ordinary cultivation of the country, every fix acres and a half might do the same.

Should agriculture experience a rapid advance towards perfection, as there is reason to imagine it will, both from the exertions of the board, and of intelligent individuals, every three or four acres, would, in a few years, be capable of supporting its inhabitant; and, as from its nature, it might certainly be carried on from one degree of perfection to another; it may even arrive at such a pitch of excellence, as that every acre of land shall support its man.

It has long since been well observed by Dr. Anderson, that while land is in the condition of common, man is debased from ever being able to embellish the soil, and thus to augment its product to the state; but that he is not prevented so essentially from deteriorating it. While, in the state of a common, the surface of the ground may be broken by him in such a way, as not to recover for ages a sparrow equivalent to that which was originally upon it. It may be cut up and link into pits; it may be converted into wet and rotten marshes, by casual obstructions being thrown in the way of the water, which no one finds it his interest to remove; it may, in short, while a common, be abused in a thousand ways, by reason of the obstinacy, indulgence, or caprice of individuals, but it never can be benefited by the industry of man; and not only may this be done, but these things actually are done, in innumerable instances; so that to a person who contemplates the loss that the nation must suffer by these deplorable abuses, nothing can afford a more melancholy train of reflections, than that which the frequent recurrence of these deplorable commons suggest to his mind, as he travels over the otherwise delightful country of England. When he flaps to inquire more minutely into the effects of this kind of property upon the morals and domestic economy of the individuals who claim a right to these commons, he only finds additional causes, he says, of regret. He frequently discovers that the quiet and industrious cultivator, having a right upon a common, is obliged to aban-
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It is evident from every one of the agricultural surveys which have been yet made, he says, that in every county in England and Wales, there are extensive tracts of land of this description (for commons and wastes may be considered as nearly synonymous terms, although it is a truth that many of these commons confit of land naturally as good as any in the kingdom). Of the extent of these lands, were it necessary, a tolerably accurate knowledge, he thinks, might be obtained; but as to the amount of improvement, it is impossible for any person to form at present an idea of it, without the prosperity of the country be permitted to go forward for a considerable length of time in that accelerating ratio into which it would naturally fall, if the general tranquility of the nation were preserved, and the obstructions which have heretofore required exertions in agriculture removed. It is enough here to say, he thinks, that it would be an object of immense magnitude. He has had occasion to observe, that in some favourable situations, it is well known that land, in the course of a very few years, has been made a thousand times at least more productive than in its original state.

Many commons are at present hung waste in situations equally favourable as these; and many other situations may become equally favourable by an extension of those modes of facilitating intercourse, which are now in contemplation, and are only prevented from being carried into effect by barriers that judicious laws may easily remove. See Waste Land.

In regard to the appropriation of comonable lands, it has been observed by Mr. Malthus, that the species of unappropriated lands in this country are, at present, 1st. Forest lands, and other extensive wastes, on which several manors, or adjacent townships, have a right of common paturage.

2d. Commonland of distinct townships, or manors, whose appropriated lands are wholly inclosed, and in a state of mixed cultivation.

3d. Commonland of townships, whose arable fields, are partially inclosed.

4th. Commonland of townships, whose arable fields remain wholly open.

And in respect to the principles on which the appropriation of such lands requires to be conducted, it may be observed, that as, by an established principle of the general law or constitution of the country, immemorial custom establishes right, neither the original rights and regulations, respecting such lands, nor the changes which may have taken place during a succession of centuries, from the origin of forests and townships, to the latest periods of time, are objects of investigation or inquiry; but many acquired rights which exist in any certain case at the time of appropriation, and which would continue to exist were it not to take place. "The poiffessor of a cottage," says the same writer, "which has enjoyed, since immemorial and without interruption, the liberty of paturage, though such cottage was originally an encroachment of a freeholder or an untenur, has indisputably as legal a claim to a proportionate share of the comonable lands, as the poiffessor of the demesne lands of the manor has (merely as such), although they may have descended from father to son from the time of their festivity. For it is evidently on the estimated values of the respective rights which exist, and which can be rightfully exercised in time to come, and on these alone, that a just and equitable distribution can be effected."

It is, however, stated, that before the distribution of comonable lands among the owners of common paturage can take place, the more affrait rights which belong to commons require to be estimated, and the just claims of their poifforors to be satisfied. These are, he says, principally manorial rights, and the rights of tithes.

The manorial claims are to be regulated by the particular advantages which the lord of a given manor enjoys, and which he will continue to enjoy, while the commons remain open and unappropriated; whether they arise from mines, quarries, water, timber, alien tenants, fuel, fowage, pannage, or game? And that his claim, as guardian of the soil, as productive
productive of pasturage only, is in most cases only honorary; he cannot as such (unless through ancient custom) profit by the herbage or the browse that the soil produces. But that the claim of the lord of the manor, in right of the soil on which thriving timber is standing, is substantial. For out of this, he has, in effect, a real yearly income, equal to the annually incrating value of the timber: a species of advantage which, if the commons remain open and unappropriated, he will in course continue to enjoy, so long as the timber continues to increase in its value. His claim, therefore, in this respect, depends on the quantity of timber, and its state of growth taken jointly. Young thriving timber not only affords an annual increase of value at present, but will continue its benefits for many years to come, if it be suffered to remain undisturbed on the soil which supports it, during the elimated period of its future increase; whereas, dotard*, and flinted trees which afford no increase of value, do not entitle their owner to any share of the soil they stand upon. The trees themselves, or their intrinsic value, are all the lord of the manor can have a right to claim."

And further, in like manner, the claims of the crown, or of hereditary rangers (if any), on the forest lands, ought, he conceives, to be satisfied.

But the claims of tithe owners, aggregately considered, are more complex and obscure. In a case where the great and small tithes are united, where the tithes of wool and lamb, and that of grain, roots, and herbage, belong to the same owner, and where no modus vivendi, it may seem to be reasonable that he should have the option of receiving land of equal value to the existing value of the whole of the tithes, or of taking the chance of their value, in the state of cultivation. But facing the evil tendency of corn tithes, and the impropriety of laying on so harmful a burthen, as they are now become, upon lands that have never borne it, there can be little risk in saying that it would be at least politic in parliament to prevent it. Besides, it stands part of the statute law, he believes, that the lands which have never been under tilage, shall not pay tithes during the first seven years of their cultivation; during which time, the incumbent's income might, by leaving the tithe to take its course, be materially abridged, and his circumstances thereby be rendered diftrefling.

It is therefore concluded, that, on the whole, it appears to be proper in this case, that the law should infract commissioners to set out lands equal to the existing value of the tithes at the time of appropriation; and, where much common land (land fit for corn) shall be appropriated, to set out a farther quantity, equal to the reversion of the extra value of the tithes to arise from such corn lands, seven years after the appropriation shall have taken place, above the value of the tithes that exist, provided any such extra value shall appear by the estimates.

And further in cases in which the tithes of land and wool, and the tithes of corn, &c. belong to separate owners, the line of rectitude and strict justice to all parties, appears, he says, to be still more difficult to draw. The former is clearly entitled to land, or a money payment equal to his lots of tithe; but the right of the other is less obvious. To cut him off entirely from any share of the lands, and likewise from any share of tithes to arise from them after they shall be appropriated, may seem unjust; he may be a lay rector, and may have lately purchased the tithes, or a clerical rector who has recently bought the advowson under the expectation of an indue. On the other hand, it appears to be hard that the proprietors of the parish should first give up land for the tithes of wool and lamb which will no longer exist, and then be liable to a corn tithe on the same lands, after they shall have bestowed on them great expense in clearing and cultivation. Indeed the injustice of such a measure is evident. A middle way, therefore, he thinks, requires to be sought; and it will be difficult, perhaps, to find one which has more justice in it than that which is proposed for the first case."

It may, however, says he, be urged that, admitting the foregoing regulation to be the true ground on which a remuneration in lieu of tithes of commomable lands ought to be elivated, the difficulties of cultivation would in some cases be great, and might be the cause of dispute and delay in the general work of appropriation; and a more practical method, though less reconcileable to theory, presents itself. Thus, let a certain proportion in value, of the lands to be appropriated as one, be allsized in lieu of the whole of the tithes of the township or manor, supposing the whole be payable in kind; and if there are more than one tithe owner in the manor or township, let the commissioners divide such aggregate allotment among the several owners and claimants, as the rector, the vicar, &c.; and the owners of land, &c. who pay the by ancient modus not in kind: such owners being entitled to a share of the said as the tith owners, in proportion to the advantage they receive, by such ancient privilege.

And if any other abstract claim on the lands to be appropriated be fairly made out, or any alien right, as that of a non-parishioner, or extra manorial occupier who has acquired by ancient grant, or by prescription, the privilege of depafluring them, be fully proved, its value requires to be accurately elminated, and land to be allsized in lieu of it."

When this has been done, the remainder of the unlimited commons of a given township or manor belongs to the owners of its common right lands and houses; but in what proportion may be difficult to determine with mathematical precision. Nevertheless, by adhering strictly to the general principle, on which alone he conceives an equitable appropriation can be conducted, viz. that of determining each man's share by the benefit which he has a right to receive at the time of appropriation, and which he may continue to receive, were it not to take place, truth and justice may be sufficiently near approached.

He considers that one of the first steps towards an equitable distribution of unlimited commons, is to ascertain the common right houses, and to distinguish them from those which have no right of commonage, and which therefore can have no claim to any share of the lands of the unlimited commons, further than the right of the lands they stand upon.

By ancient, and, he believes, pretty generally received, though somewhat vague idea, respecting the rights of commonage, the occupier of every common right house has the privilege of depafluring as many cattle, sheep, or other live stock, on the common in summer (provided, it must be understood, that it is large enough to permit every occupier to exercise this right), as the grounds he occupies within the township or manor can properly maintain in winter; and no one can exceed that proportion, for the surplus of the paflarge (if any) belongs to the lord of the soil, according to Fitzherbert and Blackstone.

Under this regulation, the appropriated lands of a common field township, which are not occupied jointly with a common right house, may be said to be deprived, during the time they are so occupied, of their right of commonage. And in some of the private bills of inclosure, which have been suffered to pass through parliament, the lands which happened to be in this state of occupancy at the time of passing
passing the bills, were deprived of their interest in the common lands, for ever: Notwithstanding, perhaps, they had a few years preceding their accidental circumstance, an undetermined right to their portion of them; a right which, a few weeks or a few days afterwears, might have reverted to them, without the smallest slight, by the temporary alienation. If any of the appropriated lands of a township or manor have been estranged from its commons, during time immemorial, have never been occupied jointly with a common right house, or in any way enjoyed of right the common pastureage, within memory, they may, with some reason, be said to have lost their right, and be excluded from a participation.

It is stated, that by this ancient, and in a degree essential, usage, common right houses have a clear right to the land of the commons, superior to the ground they stand upon; especially if they rightfully enjoy a privilege of partaking of the fuel and pannage they afford; for their properly belong to the houses, not to the lands; and still especially if they are not conveniently situated for enjoying the several benifits which the commons afford in their wild state. And whatever a common right house is worth, merely as such, that is to say, whatever it will let or sell for, over and above a common right house of the same intrinsic value, it certainly ought to participate, in the distribution, according to such extra value.

"The true proportionate shares of the common right lands are to be ascertained on the same principle. For although the ancient regulation respecting common right may continue in force while the commons remain open and unappropriated, it would be found troublesome, or unmanageable, as a rule to their just appropriation. There are few, if any, commons of common-field townships at least, that now afford pastureage in summer for all the flock which the appropriated lands are capable of maintaining in winter; so that their several proportions only could be used; and these proportions may be calculated with much greater certainty and dispatch, on the respective rental values of the lands, than on the more vague and troublesome estimation of the quantities of flock they would winter, which indeed would be best calculated by the rental value of the land. Consequently, in adopting this as the basis of calculation, the ancient rule is in effect complied with.

But still there is another circumstance, he says, of some importance, which requires attention, before an equitable distribution can be made. For although each common right occupier may have a right to flock in proportion to the productivity or rental value of his appropriated lands, every one could not do this with equal profit, and of course could not receive equal benefit. Lands situated on the side of a common, are much more beneficial in this respect, than lands which lie a mile or two from it, with bad roads between them. And it is the real advantage which an occupier can freely receive that is the true guide in the partition; which consequent ought to be conducted, not on the rental value of the land, abstractly confidered, but on this and its situation with respect to the commonable lands, jointly. In other words, it is the rental values of the common right lands while the commons remain open, not what they will become after the commons are inclosed, which he conceives to be the proper ground-work of appropriation. And that in cases where commonable lands are wholly attached to manors, and not common to the parih or township in which they are situated, as in forests and woodland districts, the self-same principle of distribution is applicable. The remainder of the commons (after the owners of abstract rights have been satisfied) belong to the common right lands and houses, no matter whether such lands and houses belong to copyhold tenants exclusively, or to copyholders and freeholders jointly, provided the immemorial custom of the manor make no distinction in their respective rights; the well established customs of manors being in all cases rules of conduct and unerring guides to commissioners."

With these he supposes, end the great difficulties as to the principles of appropriation; the rest he considers as merely technical; the works of admistration, election, and calculation; operations that are familiar to professional men in every district, and which require nothing but application and integrity to render them sufficiently accurate. It is however a matter of vital importance to have persons fully conversant with the subject as commissioners in all such cases.

Through the uncertainty and ex pense attending private acts, a great portion of these unlimited common lands remain nearly as nature left them,—appearing in the present state of civilization and science, as blotsches on the face of the country, especially when seen under the threatening clouds of famine, which have now repeatedly overcast it.

COMMON-FIELD Land, signifies a description of land of a somewhat similar kind to vast of commons, only lying in extensive fields. There is a large proportion of this sort of land in almost every county of the kingdom. It has been observed by Mr. Mallet, that the common arable fields in the county of Middlesex are about 22,000 acres; and in that, as well as in most other counties, are divided into too small properties to be advantageously cultivated. He says he has known thirty landlords on a field of 200 acres; and the property of each so divided as to lie in ten or twenty pieces, containing from an acre or two downwards to fifteen perchés; and in a field of 300 acres he has met with patches of arable land, containing eight perchés each. In this instance the average size of all the pieces in the field was under an acre. In all cases, he observes, they lie in long, narrow, winding, or worm-like slips. Land so distributed occasions great lots of time to the farmer, in removing his teams and labourers; and what is of equal importance, he can neither cross-plough nor harrow and clean such land in a workmanlike manner. And another great inconvenience attending common-field land is, the farmer cannot crop with that which béd fuels his coi, but is confined to few such grain as must be cut with his neighbours. An act to include common-field land would be advantageous to the farmer, and make the estates compact, and of more value to the owners. Neither can he sow any green or mellowing crops, vary the usual impove-riishing succession, or even destroy the vermin. In short, the cultivator of these lands finds his expenses double, and his crops only half of what they might be, if the land were laid together and well fenced."

By including the common-fields, says he, which consist of a turnip and barley field, both the landlord and the farmer are freed from the shackles of an exhausting and obsolete rotation of crops, and placed at liberty to distribute for cultivation the soil in the most improved manner, keeping it clean, in better heart, raising such roots and green crops as are in the greatest demand at market, and only growing a crop of corn for the sake of renewing the course of green and root crops. In this manner intelligent men, after inclusion, can double the produce of their land.

It is added that the invariable rotation of crops in all the common-fields is, first year a fallow, second year wheat, third year peas or oats, then begin again with a fallow. This, he says, is the destructive system of arable management that mostly prevails in this kind of land, and by which some
some of the belt land in the kingdom is condemned to be unemployed every third year; and the farmer who occupies it is compelled to pay three years rent in taxes, for two years use of it, and of course to maintain his family, farmers, cattle, and implements of husbandry, every third year, without having any return from the land. It is, therefore, impossible that lands of this sort can ever be cultivated to the greatest advantage, while they remain in their present state. See Inclosing.

It is observed by Mr. Marshall that "abund as the common field system is, in almost every particular, at this day, it was admirably suited to the circumstances of the times in which it originated, the plan having been conceived in wisdom and executed with accuracy as appears in numberless instances, even at this distance of time."

It is remarked that in the western extreme of the island the common field system has never, perhaps, been adopted; has certainly never been prevalent, as in the more central parts of England. There, a very different usage would seem to have been early established, and to have continued to the present time; when lords of manors have the privilege of letting off the lands of common pastures, to be broken up for corn, the tenant being restricted to two crops; after which the land is thrown open again to pasture in a manner more convenient for the several proprietors, and is laid each man's portion, which had confided of numberless narrow plots, in one or more well-shaped grounds, or by alt of parliament, whereby not only common fields, common meadows, and foisted pastures, but unlisted commons also, have been appropriated, by commissioners named in, or chosen in pursuance of, each respective act, who, throwing back the entire township to its original state, laid it out afresh, according to the directions of the act and their own judgment.

Common Field Husbandry, that sort of cultivation which is practiced in common fields. See Husbandry. It has been observed in the "Agricultural Report of Wiltshire," that the introduction of the common field husbandry seems to have been very slow and progressive; and that the imperfection in the smallness of the pieces, of the common field lands now in cultivation, evidently shows that the occupiers began with tilling a single acre, as one day's work for a plough, or perhaps only half an acre each; and that, as a want of corn increased, this cultivation was augmented until they had cultivated all that was most proper for that purpose, still leaving those parts which were less fit for the plough, or more distant from home, in a constant state of commonage, but by mutual agreement keeping the cattle out of the cultivated parts till after harvest. This was, probably, the origin of common fields. It does not seem probable, that any improved methods of cultivation can be adopted on common field lands, until the system of common field husbandry is abolished. See Common and Common Field Lands.

Common Meadows and Pastures, are such meadows and pastures as are held in a state of commonage. It is remarked, by the author of the "Agricultural Survey of Wiltshire" that, by the same kind of mutual agreement, as is stated in speaking of common field lands, those who have rights shut up, as in some cases included, such parts of their common pastures as were most proper to mow for hay, dividing them into certain specific quantities, either be land-marks, or by lot, for mowing, and suffering the common herd of cattle to feed there again as soon as the hay was carried off, till it was time to lay them up for a new crop; and that this was the origin of common meadows. And that the mutual agreements, originally founded in necessity, because, when approved by the lords, and ob served for a length of time by the tenants, what are called a custom of manors, constituting the very essence of the court baron, or manorial court, by which both lord and tenants were and are still bound; and of which, though the lands or his plate is the judge, the tenants are the jury, the custom of the manor equally binding both.

Common, Communes, in a general sense, something that belongs to all alike; is owned or allowed by all; and is not confined to this more than that.

In which sense, common bounds opposed to proper, peculiar, &c. Thus, the earth is said to be our common mother; in the first, or golden age, all things were in common, as well as the sun and elements; the name animal is common to man and beast; that of substance to body and spirit. Philosophers dispute whether there be any such thing as common notions, innate, or impressed on the mind by nature herself; or whether our ideas are all adventitious. See Idea.

Common, Communis; (i.e. quod ad omnes pertinent) in Law, signifies that that foil, the use whereof is common to a particular town or lordship; or it is a profit that a man hath in the land of another person, usually in common with others; or a right or privilege, which one or more persons claim to take or use, in some part or portion of that which another man's lands, or his plate, is; that is, they produce without having an absolute property in such land, waters, wood, &c. It is called an incorporeal right, which he in grant, as if originally commencing on some agreement between lords and tenants, for some valuable purposes; which by age being formed into a pretension, continues, although there be no deed or instrument in writing which proves the original contract or agreement. 4 Co. 37. 2 Nill. 67. 1 Vent. 387. And there is not only common of pasture, which the word common, in its most usual acceptation, signifies; but also common of piscary, common of estovers, common of turbary, &c. And in all cases of common, the law doth much respect the custom of the place; for there the rule is, confutudo loci ob observanda. 7 Rep. 5.

Common of pastures, is a right of feeding one's beast on another's land; for in those waste grounds, usually called commons, the property of the soil is generally in the lord of the manor; as in common fields, it is in the particular tenants. This kind of common is divided into common in gross, common appendant, common appurtenant, and common per eau des vicinage.

Common in gross, is a liberty to have common alone, that

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is without any land or tenement in another man’s land, granted either to a person for life or to him and his heirs. This is commonly passed by deed, or by warranty, or by use, and claimed by prescriptive right.

Common appurtenant, and Common appurtenant to, are usually confused; both being defined to be a liberty of common appertaining to, or depending on, such or such a freehold; which common must be taken with beasts commnurable as hores, oxen, &c. being accounted fittest for the plowman; and not with goats, geese, and hogs. Others differing between the two, thus; common appurtenant may be severed from the land whereof it appertains; and is where the owner of land has a right to put in other beasts not commnurable as hogs, goats, &c. which neither plough nor manure the land. Whereas common appurtenant, according to lord Coke, had its original in the following manner:

"When a lord enfeoffed another in arable lands to hold of him in fociage; the foecifee, to maintain the service of his plough, had at harl, by courtesy of his lord, common in the wales, for necessity beasts to eat and comprop his lands; and that for two canes; 12. Because it was tacitly implied in the fociage; by reason the foecifee could not till, or comprop his palture; by consequence, therefore, the foecifee had, as a thing necessary, or incident, common in the wales, or lands of the lord. 2. For the maintenance and advancement of tillage."

Common appurtenant belongs only to ancient arable land, and not to a house, meadow, palfure, &c. and it is of common right. But it is not common appurtenant, unless it hath been appurtenant time out of mind. 1 Danv. 746. It may be upon condition, for all the year, or for a certain time, or for a certain number of beasts, &c. by usage; though it ought to be for such cattle as plough and comprop the land to which it is appurtenant. 1 Danv. 757. Common appurtenant may be to common in a field after the corn is ferred, till the ground is relown, and it may be to have common in a meadow after the hay is carried off, till C dumbas, &c. Yelv. 185. This common, which in its nature is not restricted by number, may be limited by a common to the wales, whereas every beast to an appurtenant ought always to be for thole levant and conchant, and may be farnumber. Plowd. 161. A man may preferbe to have common appurtenant for all manner of cattle, at every seafon in the year. 25 Aff. 8. He who hath common appurtenant or appurtenant can keep but a number of cattle proportionable to his land; for he can common with no more than the lands to which his common belongs is able to maintain. 3 Saik. 93.

Common parc de vicinage, i.e. by reason of neighbourhood, is the liberty that the tenants of one lord in one town, have to common with the tenants of another lord in another town.

But it is to be observed, that those who claim this kind of common, (which is usually called intercommunining) may not put their cattle into the common of the other lord, for then they are disfrainable; but, turning them into their own fields, if they stray into their neighbour’s common, they must be filled-red.

The inhabitants of one town or lordship may not put in as many beasts as they will, but with regard to the frehold of the inhabitants of the other; for otherwise it were no good neighbourhood, upon which all this depends. Terms de Ley. If one lord excludes the common, the other town cannot then common; but though the common of vicinage is gone, common appurtenant remains. 4 Rep. 38. 7 Rep. 5. Every common parc de vicinage is a common appurtenant. 1 Danv. Abru. 799. This is indeed only a permissive right, intended to excuse what in friesians is a trespass in both, and to prevent a multiplicity of suits. And therefore either township may enclose and bar out the other, though they have intercommenced time out of mind. Black. Com. 34.

The property of the soil in the "common" is entirely in the lord; and the use of it jointly in him and the commoners. Lords of manors may departure in commons where their tenants put in cattle; and a prescription to exclude the lord is against law. 1 Inl. 122. The lord may agit the cattle of a stranger in the common by prescription; and he may license a stranger to put in his cattle, if he leaves sufficient room for the commoners. 1 Danv. 775, 2 Mod. 6. The lord may also forcharge, &c. an overplus of the common; and if, where there is not an overplus, the lord forcharge the common, the commoners are not to detain his beasts; but must commence an action against the lord. F. N. B. 125. The lord may detain when the common is free charge and bring an action of trespass for any trespass done in the common. 9 Rep. 113. A lord may make a pond on the common, though he cannot dig pits for gravel or coal; the statute of appropriation extending only to incluirae. 3 Inl. 104. 9 Rep. 112. 1 Sld. 106. If the lord makes a warren on the common, the commoners may not kill the comme; but are to bring their action, nor they may not be their own judges. 1 Rol. 92. 405. By statute of Morton (20 H. III. c. 4.) lords may "approve" against their tenants, viz. inclose part of the wale. &c. and thereby discharge it from being common, leaving common sufficient; and neighbours as well as tenants, claiming common of palfure, shall be bound by it. If the lord incloses on the common, and leaves not common sufficient, the commoners may not only break down the inclosures, but may put in their cattle, although the lord plowes and lowes the land. 2 Inl. 88. 1 Rol. Abru. 406. By lit. 29 Geo. II. c. 36. Owners of commons, with the consent of the majority, in number and value, of the commoners; the majority of the commoners, with consent of the owners, of all peruns, with the consent of the owners, of all fainly and Macklum; for the growth of wood. If the wood be delivered, the offender may be punished according to lit. 1 Geo. I. c. 48.; if not convicted in six months, the owner shall have satisfaction from the adjoining parishes, &c. as for fences overthrown by lit. Wedm. 2. Persons cutting wood on commons shall incur the same penality. And by lit. 31 Geo. 2. c. 41, the recompence is to be paid to persons injured, in proportion to their interest. A commoner hath only a special and limited interest in the soil, but yet he shall have such remedies as are commensurare to his right; and therefore he may detain beasts damage-faunt, bring an action on the cache, &c. but not being absolute owner of the soil, he cannot bring a general action of trespass for a trespass done upon the common. A commoner cannot do any thing on the soil which tends to the melioration or improvement of the common, as cutting down of beeches, fern, &c. 1 Sld. 251. 12 Hen. VIII. 2. 13 Hen. VIII. 115. Therefore, if a common every year in a field is inundated with water, the commoner cannot make a trench in the soil to avoid the water, because he has nothing to do make that trench, but only to take the grass with the mouth of the cattle. 1 Rol. Abru. 405. 2 Bull. 116. Every commoner may break the common if it be inclosed; and although he does not put his cattle in at the time, yet his right of commongage shall excuse him from being a trespasser. Lit. Rep. 38. 1 Rol. Abru. 406. If a tenant of the freehold ploughs it, and lays it with corn, the commoner may put in his cattle, and with them, eat the corn growing upon the land: so if he lets his corn
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Coercion in the field, beyond the usual time, the other commoners may, notwithstanding, put in their beasts. 2 Leon. 202, 203. The commoner cannot use common except with his own proper cattle; but if he hath not cattle to manage the land, he may common another cattle to manage it, and use the common with them; for, by the loan, they are in a manner made his own cattle. 1 Danv. 708. A commoner may detain beasts put into the common by a stranger, or every commoner may bring action of the waste, where damage is received. 9 Rep. 11. But one commoner cannot detain the cattle of another commoner, though he may those of a stranger, who hath no right to the common. 2 Lew. 1238. See Surcharge of Common, and Disturbance of Common.

Upon agreement between two commoners to inclose a common, a party having interest, not privy to the agreement, will not be bound; but one or two wilful persons shall not hinder the public good. Chan. Rep. 48. Commons must be driven yearly at Mechachmas, or within 15 days after; infected heifers and stone-horses under size, &c. are not to be put into commons. under forfeiture, by 15 Hen. VII. c. 13. New erected cottages, though they have four acres of ground laid to them, ought not to have common in the waste. 2 Inh. 740. In law-proceedings, where there are two distinct commons, the two titles must be shown: cattle are to be alleged commensal; and common ought to be in lands commensal; and the place is to be set forth where the meadows and lands lie, &c. to which the common belongs. 1 462, 463. By 15 Geo. III. c. 81, in every parish where there are "common field-lands," all the arable lands lying in such fields shall be cultivated by the occupiers, under such rules as three-fourths of them in number and value (with the consent of the land and tenants) shall appoint, by writing under their hands; the expense to be borne proportionally, under the management of a field-matter, or field-revee, to be appointed annually in May. For other particulars, see Jacob's Law Dict. by Tomlins.

COMMON, in Geometry, is applied to an angle, line or the like, which belongs equally to two figures, or makes a necessary part of both.

COMMON, in Grammar, denotes the gender of nouns which is equally applicable to both sexes, male and female.

Such is that of parent, parent; which is either masculine, or feminine, as it is used to signify either father, or mother.

The Latin grammarians, besides this, which they call the common of two, also make a common of three; which extends to masculine, feminine, and neuter.

COMMON, Communis, in Ancient Music, was an appellation given to the seventh species of the diapason. See Diapason.

COMMON Bail. See Bail.

COMMON Barrator. See Baratry.

COMMON Bench. The court of Common Pleas was anciently called Common Bench, because the pleas of controversies between common persons were there tried and determined.

In law books and references, the court of Common Pleas is written C. B. from communis banco, or C. P.: and the justices of that court are styled justiciarii de banco. See Court and Common Pleas.

COMMON Centre of Gravity, in Mechanics. See Center of Gravity.

COMMON Chord, in Music, is sometimes used to denote the third, fifth, and octave of any note, considered as a bass. It will afford some light into the composition of chords, to exhibit all the possible variations in the order or arrangement of the concord, major third (III), minor third (3d), and minor fourth (4th), constituting the common chord in the following manner, viz.

\[
\begin{align*}
\text{VII} & : & \text{V} & : & \text{VI} & : & \text{V} \\
\text{V} & : & \text{V} & : & \text{VI} & : & \text{V} \\
\text{VI} & : & \text{V} & : & \text{VI} & : & \text{V} \\
\text{V} & : & \text{V} & : & \text{VI} & : & \text{V} \\
\end{align*}
\]

By a comparison of the several chords in the first arrangement above, it will appear, that when the four notes, C, E, G, and C, constituting the common chord, are founded together, all of the seven concords, viz. 3d, III, 4th, V,
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51 Hen III. concerning general days in bank. Blount and Cowel.

COMMON, Disturbance of. See Disturbance of Common.

COMMON Dwell, in Anatomy. See DucTus CommuNus.

COMMON Estate in. See ESTATE.

COMMON of Estates. See Estates.

COMMON Field-land. See Common Fugs.

COMMON Fine, in Law, a certain sum of money, which the reiant within the liberty of some peers pay to the lord thereof; called in some places, head-deser; in others, cer-

Cious, or certain fees, and head-pace.

It was first granted to the lord towards the charge of his purchase of the court-let; whereby the reiants have now the convenience of doing their suit within their own manors, without being compelled to go to the sheriff's turn.

COMMON in Grofs. See Common Fugs.

COMMON Hunt, the chief huntsman belonging to the lord mayor and aldermen of London.

COMMON Informer. See Informer.

COMMON Intention, in Law, the common understanding, meaning, or construction of any thing, without examining it to any foreign remote or particular sense; and Bar to Common Intention, is an ordinary, or general bar, which is commonly an answer to the declaration of the plaintiff. See Bar and Intendment.

COMMON Jury. See Jury.

COMMON Law, that body of rules generally received, and held as law in this nation, in contradistinction to the statute, or written law, and including not only general customs, or the common law properly so called; but also the particular customs of certain parts of the kingdom, and likewise those particular laws, that are by custom observed only in certain courts and jurisdictions.

The common law is grounded upon the general customs of the realm, and comprehends the law of nature, the law of God, and the principles and maxims of the law; it is founded upon reason, and it is said to be the perfection of reason, acquired by long study, observation, and experience, and refined by learned men in ages. It is justly regarded as the common birth-right, which the subject has for the self-guard and defence, not only of his goods, lands, and revenues, but also of his life, and liberty, and estate, and even his life. Co. Litt. 97, 143. Treasury of Laws, 1, 2.

According to Hale, the common law of England is the common rule for administering justice within this kingdom, and affects the king's principal prerogatives, and likewise the rights and liberties of the subject. It is, in general, that law which by the determinations of the king's "Ordinary courts" are guided; and this directs the course of defendants; of lands; the nature, extent, and qualifications of estates, together with the manner and ceremonies of conveying them from one to another; the forms, solemnities, and obligations of contracts; the rules and directions for the exposition of deeds, and acts of parliament; the processes, proceedings, judgments, and executions of our courts of justice; also the limits and bounds of courts, and jurisdictions; the several kinds of temporal offenses and punishments, and their application. &c. Hale's Hist. of the Common Law, p. 24, 44, 45.

As to the origin of the common law, which, adopting the expression of lord chief justice Hale, is as undeniable Commus the head of the Nile; our ancient, both, the customs, which constitute our common law, are as old as the primitive Britons, and that they have been continued down, through
the several mutations of government and inhabitants, to the present time, unchanged and unadulterated. This, says judge Blackstone, may be the case as to some; but, in general, as Mr. Selden observes, this assertion must be understood with many grains of allowance; and ought only to signify, as the truth seems to be, that there never was any formal exchange of one system of laws for another; though, doubtless, by the intermixture of adventitious nations, the Romans, the Picts, the Saxons, the Danes, and the Normans, they must have infensibly introduced and incorporated many of their own customs with those that were before established; thereby in all probability improving the texture and wisdom of the whole, by the accumulated wisdom of diverse particular countries. Accordingly, lord Bacon observes, that our laws are as mixed as our language; and, as our language is so much the richer, the laws are the more complete. And, indeed, our antiquaries and early historians do all positively assure us, that our body of laws is of this compounded nature.

After the decay of the Roman empire, it has been said, Britain became invaded by three kinds of German people, viz. the Saxons, Angles, and Jutes. From the Jutes descended the men of Kent, and those of the Isle of Wight; from the Saxons came the people called the East, South, and West Saxons; and from the Angles came the East Angles, Mercians, and Northumbrians.

Now, as each people had its peculiar customs, so each inclined to different laws; whereas, those of the West Saxons and Mercians, who inhabited the midland counties, were, upon the diffusion of the heptarchy, and establishment of a monarchy, preferred to the rest, and acquired the common appellation of Jux Anglorum. Their particular names were Welf Saxon leges, and Mercenlages.

The first Saxon laws published in England were those of king Ethelbert, in the sixth century. Three hundred years after, king Alfred, whom our historians call magnus juris Anglicani conditor, having united the heptarchy, and rendered himself master of the whole nation, made a collection from among the numerous laws and customs of the several provinces of his dominions, which were grown so various; and commanded them to be observed throughout his kingdom. This collection was denominated folk right, and soon after the common law; as being common to the whole nation.

This was written in Alfred's dome-book, or liber judicidii, which was designed for the general use of the whole kingdom.

This book is said to have been extant in the reign of king Edward IV.; but has since been unfortunately lost. It contained, as we may reasonably imagine, the principal maxims of the common law, the penalties for misdemeanors, and the forms of judicial proceedings.

By these laws the nation was governed for a considerable time, till, being at length subdued by the Danes, the customs of those people were introduced, and incorporated with the rest. Hence the code of Alfred in many provinces fell into disuse, or, at least, was mixed and debased with other laws of a clearer alloy; and thus a new form of common law arose, called Danelage.

The three systems of law above recited, viz. the Danelage, principally maintained in several of the midland counties and also on the eastern coast; the Welf Saxon leges, which was much the same with the code compiled by Alfred, and which obtained in the counties to the south and west of the island, from Kent to Devonshire, being the municipal law of the far most considerable part of Alfred's dominions, and particularly of Berkshire, the seat of his peculiar residence; and the Merchenlages, observed in many of the midland counties, and those bordering on the principality of Wales, the retreat of the ancient Britons, and therefore probably intermixed with the Britifh or Druidical customs; were in use about the beginning of the eleventh century. The northern provinces were at this time under a distinct government. In proofs of time king Edgar began what his grandson Edward the Confessor, on this account called regum Angliearem refiduum, completed; viz. to form one digest or body of laws. This seems to have been only a new edition, or fresh proclamation of Alfred's dome-book, with such additions and improvements as the experience of a century and a half had suggested.

The Danes being afterwards, in their turn, overcome by the Normans; the Conqueror, on a review of the several laws and customs that then obtained, abrogated some, and abolished others; adding some of his own country laws.

His son, William Rufus, broke through the ancient laws and customs which his father had established; but his next son, Henry I. excluded the civil customs which his brother had introduced, and restored the laws of Edward the Confessor, with those amendments made by his father, under the advice of his barons. These were afterwards confirmed in succeeding reigns.

Hence is derived that system of maxims and unwritten customs, now known by the name of the common law, which is of Saxon parentage; though the customs and maxims themselves are of higher antiquity than memory or history reach; many of them being as old as the primitive Britons. The name of common law was given to it, either in contradistinction to other laws, as the statute law, the civil law, the law merchant, and the like; or, more probably, as a law common to all the realm, the jus commune or folk-right mentioned by king Edward the Elder, after the abolition of several provincial customs and particular laws.

The common law of England is, properly, the common customs of this kingdom; which, by length of time, have obtained the force of laws.

The goodness of a custom depends upon its having been used time out of mind; or, in the solemnity of our legal phrase, time whereof the memory of man runneth not to the contrary. This gives it its weight and authority; and of this nature are the maxims and customs which compose the common law, or lex non scripta, of this kingdom. This unwritten, or common law, is properly distinguished into three kinds; 1. General customs, which are the universal rule of the whole kingdom, and form the common law, in its stricter and more usual signification. 2. Particular customs, which for the most part affect only the inhabitants of particular districts. 3. Certain particular laws; which by custom are adopted and used, by some particular courts, of pretty general and extensive jurisdiction. See Custom.

Some have divided the common law into two principal grounds or foundations; viz. 1. Established customs; such as that, where there are three brothers, the eldest brother shall be heir to the second, in exclusion of the youngest; and, 2. Established rules and maxims; as, that the king can do no wrong; that no man shall be bound to accuse himself; and the like. But judge Blackstone observes, that these are one and the same thing. For the authority of these maxims rests entirely upon general reception and usage; and the only method of proving,

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proving, that this or that maxim is a rule of the common law, is by showing that it hath been always the custom to observe it. See Custom.

It is called lex non scripta, the unwritten law: not but that we have most of it written in the old Norman dialect, and the monuments and evidences of our legal customs are contained in the records of the several courts of justice, in books of reports and judicial decisions, and in the treatises of learned fages of the profession, preserved and transmitted from times of the highest antiquity, but because it does not appear to be made by charter, or parliament; for those are always matters of record. Its original institution and authority are not set down in writing, but it receives its binding power and the force of law, by long and immemorial usage, and by universal reception through the kingdom. See Authorities and Reports.

Besides the common law of England in general, there are in divers parts of the nation particular customs, and common usages, which have the force of common law among those people, who have retained them: such as the Borough-English, Gavel-kind, &c.—Where the common law is silent, there the Statute-law speaks. See Statute.

All trials at common law are by a jury of twelve men. Among the ancient and most eminent writers on common law we may select and enumerate the following. Britton wrote his learned book of the common law of this reign by the king’s command, and it runs in his name, corresponding to the institutions of the civil law, which Justinian assumes to himself, though composed by others. He thus describes the king in six books, of which the last is of the Roman law. Britton, a great lawyer in the time of Henry III., wrote a very learned treatise of the common law of England, held in great estimation; and he was said to be lord chief-justice of the kingdom. The famous and learned Glanville, lord chief-justice in the reign of Henry II., wrote a book of the common law, which is said to be the most ancient composition extant on that subject. Besides these, in the time of Edward IV. the renowned lawyer Littleton wrote his excellent book of “English Tenures.” In the reign of king James I., the great oracle of the law, Sir Edward Coke published his learned and laborious Institutes of our law, and commentary on Littleton. About the same time likewise Dr. Cowl, a civilian, wrote a short institute of our laws. In the reign of king George I., Dr. Tho. Wood, a civilian and common lawyer, and at last a divine, wrote an institute of the laws of England, somewhat after the manner of the Institutes of the civil law. And to mention no others, the late learned judge Blackstone, in the reign of George III., published his Commentaries on the laws of England, the best analytic and most methodical system of our laws, which was ever published; and equally adapted for the use of students, and of those gentlemen who wish to acquire that knowledge of our laws, which is, in fact, essentially necessary for every one. See biographical articles Britton, Bracton, &c. &c.

Common measure divisor, in Arithmetic, a number that exactly measures two other numbers, without a remainder. And the greatest number that can measure any two other numbers, is called their greatest common measure; thus 4 is the greatest common measure of 8 and 12.

To find the greatest common measure of two numbers, divide the greater by the less, and if there be no remainder, the less number is the measure required. If there be a remainder, divide the last divisor by it, and thus proceed, till there be no remainder left, and the last divisor is the greatest common measure.

E. G. To find the greatest common measure of 816 and 1438.

\[
\begin{array}{c}
816)1438(1 \\
816 \\
672)816(1 \\
672 \\
144)672(4 \\
568 \\
104)672(6 \\
648 \\
124(10 \\
96 \\
28 \\
0
\end{array}
\]

Common measure - 28

For algebraic quantities, the remainders are to be divided by their simple divisors, and the quotients will be the quantities required.

E. G. Let the quantities be \( a^2 + 2ab + b^2 \) and \( a^2 + 2ab + b' \).

Divide the latter of these by the former in the following manner:

\[
a^2 + 2ab + b^2 | a^2 + 2ab + b' (a + b + b')
\]

The remainder is \( a^2 - b^2 \), which being divided by \( b' \), its greatest simple divisor, given \( a + b \) and by this divide \( a^2 - b^2 + b' \), and the quotient will be \( a + b \), exactly, which is the common measure required. And if fractions are divided by their greatest common measure, they will thus be reduced to their lowest terms.

E. G. Let the fraction be \( \frac{816}{1438} \); then divide the numerator and denominator by 48, the greatest common measure, and the fraction will be reduced to \( \frac{17}{31} \), its lowest terms.

Let the algebraic fraction be \( \frac{a^2 + 2ab + b}{a^2 + 2ab + b'} \); then, dividing the numerator and denominator by \( a + b \) the greatest common measure, and it will be reduced to \( \frac{a + b}{a^2 + b} \), its lowest terms.

These operations are founded on this principle, viz. that whatever quantity measures the whole and one part of another, must afo measure the remaining part. For that quantity (whatever it is) which measures both the divisor and dividend, must evidently measure \( a^2 + 2ab + b' \) being a multiple of the former; whence, by the above-cited principle, the same quantity, as it increases the whole dividend, must also measure the remaining part of it, \( a^2 + b' \) but the divisor, which we are seeking, being a compound one, we may call off the simple divisor \( b' \), as not answering our purpose; whence \( a + b \) appears to be the only compound divisor which the case admits of; and this must be the common measure required, if the proposed example admits of any such.

Common. Month, Motion, Nuisance, and Object. See the Substantives.

Common of Pafiure. See Pasture and Common.

Common of Piscary. See Piscary.

Common Place Book. Adversaria, among the learned, denotes a register, or orderly collection of things which occur worthy to be noted, and retained in the course of a man’s
man’s reading, or study; so disposed, as that among a
multiplicity of subjects, any one may be easily found.

Common place-books are of great service; they are a
kind of promptuaries or storehouses, wherein to repose the
most valuable parts of authors, to be ready at hand when
wanted. Several persons have their several methods of or-
dering them: but that which comes best recommended, is
the method of that great matter of order Mr. Locke. He
has thought fit to publish it in a letter to M. Toftnard; de-
termined thereto, by the great convenience and advantage
he had found it in twenty years experience; as well as
by the recommendations and intracacies of many of his friends,
who had likewise proved it.
The fabulosity of this method we shall here give the
reader; whereby he will be easily enabled to execute it him-
self.
The first page of the book you intend to take down the
common places in, is to serve as a kind of index to the whole;
and to contain references to every place, or matter there-
in: in the commodious contrivance of which index, so
that it may admit of a sufficient copia, or variety of ma-
terials, without any confusion, the whole secret of the me-
thod consists.

In order to this the first page, as already mentioned, or
for more room, the two first pages that front each other, are
to be divided by parallel lines, into twenty-five equal parts;
whereof every fifth line is to be distinguished, by its colour,
or some other circumstance. These lines are to be cut per-
pendicularly by others, drawn from top to bottom; and in
the several spaces thereof the several letters of the alpha-
bet, both capital and minuscule, are to be duly written.

The form of the lines and divisions, both horizontal and
perpendicular, with the manner of writing the letters
therein, will be conceived from the following specimen;
which is what is to be done in the book for all the letters
of the alphabet, is here shewn in the first four, A, B, C,
and D.

The index of the common-place book being thus formed,
matters are ready for the infection of any thing in it.
In order to this, consider to what head, the thing you
would enter is most naturally referred; in this head, or
word, regard is had to the initial letter, and the first vowel
that follows it; which are the characteristic letters on which
the whole use of the index depends.

Suppose, e. g. I would enter down a passage that refers
to the head beauty: B, I consider, is the initial letter, and
e the first vowel; then looking upon the index for the par-
tition B, and therein the line e (which is the place for all
words whose initial letter is B, and first vowel e; as Beauty,
Beneficence, Bread, Bleeding, Blemishes, &c.), and finding
no numbers down already to direct me to any page of the
book where words of this characteristic have been entered,
I turn forward to the first blank page I find, which in a
fresh book, as this is supposed to be, will be page 2, and
here I now write what I have occasion for on the head
beauty; beginning the head in the margin, and indenting
all the other sublervent lines, that the head may stand out,
and show itself; this done, I enter the page where it is
written. viz. 2, in the index, in the space B e, from which
time, the class B e becomes wholly in the possession of the
2d and 3d pages, which are configured to letters of this cha-

Had I found any page or number already entered in the
space B e, I must have turned to the page, and have written
my matter in what room was left therein: so, if after
entering the passage on beauty, I should have occasion for
benevolence, or the like, finding the number 2 already pos-
sessed of the space of this characteristic, I begin the pas-
tage on benevolence in the remainder of the page; which
not containing the whole, I carry it on to page 3, which is
also for B e, and add the number 3 in the index. When
the two pages defined for one class are full, look forward
for the next backside that is blank; if it be that which im-
mediately follows, write at, the bottom of the margin of
the page filed, the letter υ for vertic, turn over; and the
same at the top of the next page: and continue from this
new page as before. If the pages immediately following
be already filled with other classes, then write at the bottom
of the page last filed, the letter υ, with the number of the
next blank page; and at the top of that page, the number
of the page last filled; then entering that head in this new
page, proceed as before. By these two numbers of refer-
ce, the one at the top, and the other at the bottom of the
page, the discontinued matters are again connected. It
may not be amiss, every time you put a number at the bot-
tom of a page, to put it likewise in the index. Now, if
the head be a monosyllable beginning with a vowel, the
vowel is at the same time both the initial letter, and the
characteristic vowel; thus the word art is to be written in
A n. Mr. Locke omits three letters of the alphabet in
his index, viz. K, Y, and W; which are supplied by C,
I, U, equivalent to them: and as for Q, since it is always
followed by an u, he puts it in the fifth place of Z; and so
has no Z u, which is a characteristic that very rarely occurs.
By thus making Q the last in the index, its regularity is
preferred, without diminishing its extent. Others choose to
retain the class Z u, and affix a place for Q u below the
index.

If any imagine, that those hundred classes are not suffi-
cient to comprehend all kinds of subjects without confusion,
he may follow the same method, and yet augment the num-
ber to five hundred, by taking in one more characteristic to
them.

But the inventor assures us, that in all his collections, for
a long series of years, he never found any deficiency in the

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3
index as above laid down. Other contrivances for common-place books have been proposed; but they are such as will naturally occur to persons conversant with the subject, and accustomed to orderly arrangement: and it is, therefore, needless to extend this article.

COMMON Pleas. See Court of Common Pleas. Compound Prayer, is the liturgy of the church of England. Clergymen are obliged to use this liturgy in the service of the church; and refusing to do so, or using any other public prayers, is punishable by 1 Eliz. cap. 2. and every incumbent refusing on his living and keeping a curate, is obliged, once every month at least, to read the common prayer in his parish church, in his own person, under a forfeiture of 5l. for every failure, by the act of uniformity, 13 and 14 Car. II. cap. 4; and by the same ft. every church is to be provided with a book of common prayer, under the penalty of 3l. a month, and the common prayer is to be read before every lecture. Every minister who speaks any thing in derogation of this book, shall, if not benefited, be imprisoned for one year for the first offence, and for life for the second; and, if he be benefited, he is liable to six months imprisonment, and the forfeiture of a year's value of his benefice; for the second offence to deprivation and one year's imprisonment; and for the third offence to deprivation and imprisonment for life: and any person convicted of reviling it in plays, songs, or other open words, or of forcibly preventing its being read, or of causing any other service to be read in its stead, shall forfeit for the first offence an hundred marks; four hundred for the second; and for the third offence all his goods and chattels, and suffer imprisonment for life. Stat. 1 Eliz. cap. 2. See Liturgy. Common Receptacle. See Receptaculum. Common Recovery. See Recovery. Common Right of. See Common. Common Staid. See Scold. Common Sense. See Sense. Common Sense. See Sensory. Common Servant. See Servant. Common Surcharge. See Surcharge. Common Tenants in. See Tenant. Common Time. See Time. Common Voucher. See Voucher. Common Ways. See Way. Common Wealth denotes "bonum publicum," or the public good, and is much favoured in our laws, and therefore many things are legally tolerated, with a view to the public good, which otherwise might not be done. Hence it is that monopolies are void in law, and that bonds and covenants to refrain free trade, tillage, and the like, are adjudged void. 11 Co. Rep. 50. Plowd. 25. Shep. Epit. 270. Common Year. See Year. COMMUNABLE LANDS, in Agriculture, are such lands as are generally in some measure arable, and which belong, in property, to individuals who are known, and the limits of whole property are ascertained: but which, in regard to their culture and mode of cropping, are subject to certain regulations, which common, for time immemorial, has established, so as gradually to have acquired the force of law, to which rules every individual occupying such property must adhere, until these old customs shall be abrogated, either by the unanimous consent of all the individuals having a right to such communable lands, or by an express statute, obtained with their consent, for the purpose of annulling them.

In some countries, Dr. Anderson says, it appears that not much less than one half of the whole arable lands are in this state; although it is evident, by the concurring testimony of all the agricultural reports, that taking all these lands at an average, they do not afford half the produce the same lands would do, if they were put under the ordinary management that appropriated farmers are subject to in their respective districts: and not perhaps one tenth part of what they might easily be made to afford, within a very short period of time, should all other obstructions to improvement be removed. It would be timefome, he says, to enumerate all the facts that occur in the different agricultural surveys, tending to point out the pernicious tendency of this mode of tenure: but a few of them may be mentioned. In one place it is stated, that a few inclosures had been made, seemingly with the concurrence of all the parties concerned; but when the hedges had advanced nearly to become a fence, one of the communable tenants went deliberately and pulled them up by the roots, and eradicated them entirely. In another case the parishioners having come to an agreement to plant clover, after that practice has been universally acquiesced in for the space of eighteen years, one of the farmers, occupying extensive acres of land, bought a large flock of lean sheep in the month of May, and turned them on the clover crops, which were nearly in bloom, and no one could hinder him. In another case, where customs had established the practice of having one corn crop, and one fallow, alternately, the occupier of the district came to an agreement to have two crops and a fallow alternately; but before the expiration of ten years, one of the farmers broke through the arrangement, and turned his cattle upon the crops of beans, oats, and barley: in which plan he was followed by the rest of his neighbours; and the crops were, in consequence, totally destroyed on that part of the field, which, agreeable to the ancient custom, should have been that year in fallow. These notices, while they tend to illustrate the nature of this particular kind of tenure, at the same time, he says, clearly demonstrate its pernicious tendency to the public. No one, who has considered the subject for a moment, but will readily admit, that it were much for the interest of Britain that no such practice existed in it: and that, of course, no time should be lost in endeavouring to eradicate it; for, were this effectually done, it must appear evident from the facts stated, that the total produce of the kingdom would be greatly augmented and improved. See Common. COMMONALTY, comprehends one division of the civil state; the nobility being the other; and like the nobility, includes several degrees of rank and condition. In Art. super Chartera, 28 Ed. 1. c. 1., the words "Tout le commune de l'Engletterre," signify all the people of England. 2 Inf. 539. But the term is generally used for the middle rank of the king's subjects, such of the commons as are ranked above the ordinary fort, and having the management of offices, are by that means one degree below gentry, who are superior to them in order and authority, and companies incorporated are said to consist of masters, wardens, and commonalty, the first two being the chief, and the others such as are usually called of the livery. The ordinary people, and freeholders, or at least knights and gentlemen, under the degree of baron, have been, in late years, called "communitis regni," or "tota terra communitas;" yet anciently, if we credit Edward the barons and tenants in capite, or military men, were the community of the kingdom, and those only were reputed as such in our most ancient histories and records. Brady's Gloss. to his introd. to Eng. Hist. COMMONE, in Ancient Geography, the name of an island
in the Mediterranean, placed by Pliny on the coast of Ionia.

COMMONER, is used for a student in some universities, entered in a particular rank.

The word is also applied to a member of the house of commons, in contradistinction to a peer.

COMMONI, in Ancient Geography, a denomination given by Ptolemy to a people of Gallia Narbonensis, who inhabited the country, including the town of Tarraconensis, the promontory of Cithareides, the town of Olbia, that of Forum Julii, &c.

COMMONS, in a general sense, consists of all such men of property in the kingdom, as have not seats in the house of lords; every one of whom has a voice in parliament, either personally, or by his representatives. In a free state, says judge Blackstone, every man who is supposed a free agent, ought to be in some measure his own governor; and, therefore, a branch at least of the legislative power should reside in the whole body of the people. And this power, when the territories of the state are small, and its citizens easily known, should be exercised by the people in their aggregate or collective capacity; as was widely ordained in the petty republics of Greece, and the first rudiments of the Roman state. But this will be highly inconvenient, when the public territory is extended to any considerable degree, and the number of citizens is increased. Thus when, after the Social war, all the burghers of Italy were admitted free citizens of Rome, and each had a vote in the public assemblies, it became impossible to distinguish the frivolous from the real voter, and from that time all elections and popular deliberations grew tumultuous and disorderly; which paved the way for Marius and Sulla, Pompey and Caesar, to trample on the liberties of their country, and at last to diffuse the commonwealth. In so large a state as ours, it is therefore wisely contrived, that the people should do that by their representatives, which it is impracticable to perform in person; representatives chosen by a number of minute and separate districts, wherein all the voters are, or easily may be, indiscriminately.

COMMONS, in parliament, are the lower house, consisting of knights elected by the counties, and of citizens and burgesses by the cities and borough-towns. See Borough, Burgess, and Knight.

In these elections, anciently, all the people had votes; but in the 8th and 9th of King Henry VI. for avoiding tumults, laws were enacted, that none should vote for knights but such as were freeholders, did reside in the county, and had forty shillings yearly revenue; equivalent to near 20l. a year of our present money: the persons elected for counties to be miles notabiles, at least esquires, or gentlemen fit for knighthood; native Englishmen, at least naturalized, and twenty-one years of age: no judge, sheriff, or ecclesiastical person, to sit in the house for county, city, or borough.

The house of commons, in Fortescue's time, who wrote during the reign of Henry VI. consisted of upwards of 300 members: in Sir Edward Coke's time their number amounted to 493. At the time of the union with Scotland, in 1707, there were 513 members for England and Wales, to which 45 representatives for Scotland were added: so that the whole number of members amounted to 558.

In consequence of the union with Ireland, in 1801, 100 members were added for that country; and the whole house of commons now consists of 658 members; viz. 80 knights for 40 counties in England; 50 citizens for 25 cities (Edinburgh none, and London four); 334 burgesses for 167 boroughs, and 5 burgesses for 5 boroughs, viz. Abingdon, Banbury, Beverley, Higham Ferrers, and Monmouth + Vol. IX.

burrigesses for the two universities of Oxford and Cambridge; 16 barons for the 8 cinque-ports, viz. Hullings, D. Berwick, Sandwich, Romney, Hythe, and their three branches, Ryde, Weymouth, and Seaford; 12 knights for 12 counties in Wales; 12 burghers for 12 boroughs in that county; 50 knights for the shires of Scotland, and 15 burghers for its boroughs; 64 knights and 36 burghers for Ireland. For an account of the privileges of members of the house of commons, and other particulars, see Parliament.

COMMONS is also used in opposition to noble or peer, viz. for all sorts of persons under the degree of a baron; including the orders of knights, esquires, gentlemen, the sons of the nobility, and yeomen. See under each its proper article, Esquire, Gentleman, Yeoman, &c.

COMMONS, Doctors. See College of Civilians.

COMMONS, Prior of the. See Proctor.

COMMONS is also used for the stated and ordinary diet or eating, of a college; an inn of court, or other society. See Inn, &c.

COMMONWEALTH. See Republic.

COMMONWEALTH of England, in History, a form of government introduced after the dissolution of the monarchy by the death of Charles I., in 1649. The change of government seems to have been suggested in the preceding year by a council of officers, who took into consideration a scheme called "The Agreement of the People!" being the plan of a republic to be established in the place of that government which they were demolishing; but the commonwealth was not established till after the tragic event of the king's death. Soon after this event, the house of commons published an act to forbid the proclamation of Charles Stewart, eldest son of the late king, or any other person, on pain of high treason. On the same day the lords desired a conference with the commons about settling the government and the administration of justice, the commissions of the judges having been determined by the king's death. The commons, without answering the message, voted the house of lords to be useless and dangerous, and therefore to be abolished. They only left the lords the privilege of being elected members of parliament, in common with other subjects. Thus, the parliament, which at first was composed of the king, 120 lords, and 513 commoners, was reduced to a house of commons, consisting of about 30 members, few of whom at the beginning had 500l. yearly income. Nevertheless, these few and inconsiderable members assumed the name of a parliament, and acted as if their body had been invested with the authority which had before reposed in the king, lords, and commons. But they were previously disqualified and prepared for the business which they undertook to execute, and they were aided and supported by an army of near 50,000 men, formidable from its discipline and courage, as well as its number, and actuated by a spirit that rendered it dangerous to the assembly, which had assumed the command over it. It must be confessed, however, that in this parliament there were some men of dignified capacity and integrity, and that if they adopted erroneous principles, or purified those that were just and reasonable to an unwarrantable extent, they were deluded neither of talents nor of influence to defend and support them. The sovereign authority, as they maintained, reposed originally in the people, by whom a part of it was committed to the kings, chosen to govern them according to law; and they alleged, that the king's abuse of this trust had broken the original contract between king and people, and that, in consequence of this violation, the contract had lasted no longer, but the sovereign power reverted to the people, as to its original source. Considering themselves as the representatives of the people, they conceived that they had
had a right to change the form of the government, without any regard to the original contract annulled by the king in his violation of the laws. Upon these principles, the commonwealth, assuming the name of parliament, voted, and afterwards enacted, that the kingly office should be abolished as unnecessary, burdensome, and dangerous, and that the state should be governed by the representatives of the people in a house of commons without a king or lords, and under the form of a commonwealth. The former oaths of allegiance and supremacy were abolished, and a new oath was prepared, called "The Engagement," by which every man swore, that he would be true and faithful to the government established, without king or peers. Justice was no longer to be administered in the king's name, but the name, style, and title of the state were to be, "catholica libertatis Angliae, authoritative parliament." A new great seal was to be made; new money to be coined; and, in a word, every thing was to be detached and abolished, that bore any marks of royalty. A great seal was therefore made, on one side of which was seen the parliament sitting, with this inscription: "the great seal of the parliament of the commonwealth of England." And on the other side, the arms of England and Ireland, with these words, "the first year of freedom by God's blessing restored." This seal was committed to a certain number of persons, who were styled "keepers of the liberties of England." And it was ordained, that, for the future, all public orders should be dispatched in the name of the state, under the direction of the parliament. The parliament also made choice of 20 persons to form a council of state for the administration of public affairs under the parliament; to this council all addresses were made; they gave orders to all generals and admirals, executed the laws, and digested all business before it was brought into parliament. They professed to employ themselves entirely in adjusting the laws, forms, and plan of a new representation; and as soon as they should have settled the nation, they avowed their intention of restoring the power to the people, from whom they acknowledged, they had wholly derived it. The parliament also erected a high court of justice, consisting of 60 members, to try some persons of distinction, who were in their power. The commonwealth, thus formed and established, found England composed into a feeming tranquillity by the terror of its arms. Foreign powers, occupied in wars among themselves, had no leisure nor inclination to interpose in the domestic diffections of this island. The young king, poor and neglected, living sometimes in Holland, sometimes in France, sometimes in Jersey, indulged the hope, among his present difficulties, of better fortune at some future period. The situation alone of Scotland and Ireland occasioned any immediate inquietude to the new republic. As to the Scots, they were all-well for the present to take their own measures in setting their government; but Ireland demanded more immediately their efforts for subduing it. Cromwell, having obtained the appointment of lieutenant in that country by his interest in the council of state, left no time in passing thither; and he proceeded with much uninterrupted success, that in the space of nine months he had almost entirely subdued it. Afterwards, leaving the command of Ireland to Ireton, who governed that kingdom in the character of deputy, he hastened home, and was declared captain-general of all the forces in England. Having received this honourable appointment, he immediately marched his forces and entered Scotland; where Charles, who had been invited thither, was making considerable progress, with an army of 16,000 men. Cromwell having gained a decisive victory over the Scots in the battle of Dunbar, and having taken possession of Edin-
which had filled all Europe with the renown of its actions, and with atrocity at its crimes, and the commencements of which was not more ardently desired by the people than its first dissolution. Parliament having been thus dissolved, Cromwell might have assumed the administration of the government by an authority similar to that with which he had dismissed the parliament. But he chose to proceed in his assumption of the sovereign power by more cautious steps, and with some appearance of respect for the popular opinion. Accordingly, by the advice of his council of officers, he sent summoners to 128 persons of different towns and counties of England, to five of Scotland, and six of Ireland; and he pretended by his sole act and deed to devolve upon himself the whole authority of the state. This legislative power they were to exercise during 15 months; and they were afterwards to choose the same number of persons, who might succeed them in that high and important office. They immediately voted themselves a parliament, called by way of derivation from Barebone, a leather-seller, one of their number, "Barebone's parliament;" and having their own consent, as well as that of Oliver Cromwell, for their legislative authority, they now proceeded very gradually to the execution of it. The members of this legislative assembly, of which Cromwell himself was a member, though he had introduced into it several members entirely devoted to his own interest, found themselves unequal to the burden imposed upon them; and having met, by consent, at an early hour, they agreed to dissolve themselves and to resign the sovereign authority into the hands from which they had received it. They hastened, therefore, to Cromwell, along with Roufe, their speaker; and by a formal deed of alignment referred to him the supreme authority. The council of officers now proposed to adopt another scheme of government, and to temper the liberty of a commonwealth by the authority of a single person, who should be known by the application of protector. Without delay, Lambert, who made this proposition, prepared what was called "the instrument of government," containing the plan of this new legislature; and as it was supposed to be agreeable to the general, it was immediately voted by the council of officers. Cromwell was declared "protector," and with great solemnity installed in that high office. The chief articles of the aforesaid instrument are these: a council was appointed, the number of which was not to exceed 21, nor to be less than 13 persons. They were to enjoy their office during life or good behaviour; and in case of a vacancy, the remaining members named three, of whom the protector chose one. The protector was appointed supreme magistrate of the commonwealth; in his name all justice was to be administered; from him were all magistracy and honours derived; he had the power of pardoning all crimes, excepting murder and treason; to him the benefit of all forfeitures devolved. The right of peace, war, and alliance rested in him, with the advice and assistance of his council. The power of the sword was vested in the protector jointly with the parliament, while it was sitting, or with the council of state in the intervals. He was obliged to summon a parliament every three years, and allow them to sit five months without adjournment, prorogation, or dissolution. The bills which they passed, were to be presented to the protector for his assent; but if they were not obtained within twenty days, they were to become laws by the sole authority of parliament. A standing army for Great Britain and Ireland was established, of 20,000 foot and 10,000 horse; and funds were assigned for their support. These were not to be diminished without the consent of the protector; and in this article alone he assumed a negative.

During the intervals of parliament, the protector and council had the power of enacting laws, which were to be valid till the next meeting of parliament. The chancellor, treasurer, admiral, chief governors of Ireland and Scotland, and the chief justices of both the benches, must be chosen with the approbation of parliament; and in the intervals, with the approbation of the council, to be afterwards ratified by parliament. The protector was to enjoy his office during life, and on his death, the place was to be in m. duly supplied by the council. Such was the instrument of government bestowed by the council of officers, and solemnly sworn to by Oliver Cromwell. The council of state, named by the instrument, consisted of 15 persons; men entirely devoted to the protector, and by reason of the opposition among themselves in party and principles, not likely ever to combine against him. The military force of the country was exerted under this government with vigour, conduct, and unanimity; and never did the kingdom appear more formidable to all foreign nations. In September, 1654, a new parliament was summoned. Of 400 members, which represented England, 275 were chosen by the counties; the rest were elected by London, and the more considerable corporations; at the small boroughs having been deprived of their right of election, because they were the most exposed to influence and corruption. The lower populace, in easily guided or deceived, were also excluded from the elections; an estate of 200/. value was necessary to entitle any one to a vote. The elections of this parliament, says Mr. Hume, were conducted with perfect freedom; and excepting, that part of the royalists which had borne arms against the parliament and all their sons were excluded, a more fair representation of the people could not be desired or expected. Thirty members were returned from Scotland, and as many from Ireland. This parliament, having heard the protector's speech of three hours length, and having chosen Lenthall for their speaker, immediately entered into a discussion of the instrument of government, and of that authority, which Cromwell, by the title of protector, had assumed over the nation. The greatest liberty was used in arranging this new dignity; and even the personal character and conduct of Cromwell shaped not without censure. The protector, surprised and enraged at the refractory spirit of the parliament, sent for them to the painted chamber, and authoritatively reproached against their conduct. He obliged the members to sign a recognition of his authority, and an engagement not to propose or consent to any alteration in the government, or the protection of his person and parliament; and he placed guards at the door of the house, who allowed none but subscribers to enter. Most of the members, after some hesitation, submitted to this condition; but retained the same refractory spirit which they had manifested in their first debate. Cromwell hastened to the dissolution of this dangerous assembly, and having ordered their attendance, he delivered to them a speech, composed, angry and rage, and disinherited them.

In 1656, Cromwell, having pleased by his administration so much labour and success abroad, and to such order and tranquility at home, ventured to summon a parliament, having taken previous measures for filling the house with his own creatures and party. The period, however, that the majority would not be favourable to him. For, there were, let guards on the door, who permitted none to enter, but such as produced a warrant from his council; and the council rejected about a hundred, who either refused to recognize the protector's government, or were on other accounts obnoxious to him. These protected against a violence which was subversive of all liberty; but every application.
tion for redress was neglected both by the council and parliament. In this parliament a motion was made to level the crown on Cromwell; and no surmise or reluctance was discovered on the occasion. A formal motion was afterwards made to the same purpose; but it produced great disorder, and divided the house into parties. The bill was however voted by a considerable majority; and a committee was appointed to reason with the protector, and to over come those terrors which he pretended against accepting a liberal offer. Cromwell's chief difficulty arose from the opposition of the officers; and he justly dreaded a mutiny in the army. At length he determined to decline the acceptance of that crown, which the representatives of the nation, in the most solemn manner, had tendered to him. The parliament, when Cromwell had rejected the royal dignity, found themselves obliged to retain the name of a commonwealth and protector; and as the government had hitherto been a manifest usurpation, it was thought proper to function it by a leening choice of the people and their representatives. Accordingly, instead of "the instrument of government," which was the work of the general officers alone, an "humble petition and advice" was framed, and offered to the protector by the parliament. This was represented as the great basis of the republican establishment, regulating and limiting the powers of each member of the constitution, and securing the liberty of the people to the most remote posterity. By this deed, the authority of protector was in some particulars enlarged; in others, it was considerably diminished. He had the power of nominating his successor; he had a perpetual revenue assigned him, of a million a year for the pay of the fleet and army, and 300,000L. for the support of civil government; and he had authority to name another house, the members of which should enjoy their seats during life, and exercise some functions of the former house of peers. But he abandoned the power affirmed in the intervals of parliament, of framing laws with the consent of his council; and he agreed, that no members of either house should be excluded but by consent of that house, of which they were members. The other articles were much the same with those contained in the instrument of government. This model of government, the humble petition and advice, was accepted for the voluntary deed of the whole people in the three united nations; and Cromwell, as if his power had just commenced from this popular consent, was anew inaugurated in Westminster Hall, after the most solemn and pompous manner.

In 1653 the parliament was again assembled; confounding, as in the times of monarchy, of two houses, the commons and the other house: Cromwell, during the interval having lent his hand to the house of peers, which confounded 60 members. Upon the death of Cromwell in 1658 (see Cromwell) the council recognized the succession of his son Richard. A parliament was called; and in hopes of obtaining greater influence in elections, the ancient right was restored to all the new boroughs; and the counties were allowed no more than their usual members. The house of peers, or the other house, confounded of the same persons that had been appointed by Oliver. All the commons, at first, argued an engagement, without hesitation, not to alter the present government; but next proceeded to examine "the humble petition and advice," and after much debate it was confirmed. But though parliament acquiesced, cabals were formed against the new protector by the army. Richard, who professed neither penetration nor resolution, was prevailed on to give an unguarded consent for calling a general council of officers; but as soon as they were assembled, they voted a remonstrance; and they proposed that the whole military power should be entrusted to some person, in whom they might all confide. The protector, who was in his disposition gentle, humane, and generous, was justly alarmed at the movements of the officers; nor was the parliament less alarmed at the military cabals. They voted that there should be no meeting or general council of officers, except with the protector's consent, or by his orders. This enraged the officers, who hastened to Richard, and demanded of him a dissolution of the parliament. The parliament was dissolved; and by the same act, the protector was, by every one, considered as dethroned. Soon after he signed his dismission in form: and withdrawing into retirement, extended his peaceful life to an extreme old age. The council of officers, now possessed of supreme authority, deliberated what form of government they should establish. It was agreed at last to revive the long parliament, which had been expelled by Cromwell. The members of this parliament did not exceed 70; but they resolved, since they enjoyed the title of the supreme authority, and observed that some appearance of a parliament was requisite for the purposes of the army; not to act a subordina part to those who acknowledged themselves as their servants. They chose a council consisting of 7 persons, who should nominate to such commands as became vacant; and they voted, that all commissions should be received from the speaker, and be assigned by him in the name of the house. The general officers were disfranchised by those precautions; but the state of the country prevented their manifesting their disgust. As soon as an interval occurred, they renewed their hostility, and expelled the parliament. The officers, again possess'd of supreme authority, elected a committee of 23 persons, of whom 7 were officers, whom they pretended to invest with sovereign authority; and they called them "the committee of safety." On the approach of danger, Lenthall the speaker was invited by the officers to summon the parliament, which had twice before been expelled, with so much reproach and ignominy. But general Monk was advancing with his army, and having sent a message to the parliament from St. Albans, deposing them to remove from London those regiments, which had so lately offered violence to their assembly; he marched towards London and took quarters at Westminster. He afterwards required parliament, in the name of the citizens, soldiers, and whole commonwealth, to issue writs for the filling of their house, and to fix the time for their own dissolution, and the assembling of a new parliament. The parliament attempted to conciliate the general, and dispatched a committee to him for this purpose; but he refused to hear them, except in the presence of some of the seceded members. These members, upon the general's invitation, were restored; and the long parliament, after having passed some resolutions for the compoΨure of the kingdom, dissolved itself, and issuing writs for the immediate assembling of a new parliament. When the parliament met, measures were taken for the recall of Charles II.; he was proclaimed in the presence of the two houses, on the 8th of May, and on the 26th, which was his birth-day, the king entered London. Rapin's Hist. vol. xi. Ham's Hist. vol. viii.


COMMORTH, from the Brit. Cymmorf, q. d. subfiubium, a contribution which was gathered at marriages, and when young priests said or sung the first missal, &c. See deat. 4 Hen. IV. c. 27. But deat. 26. Hen. VIII. c. 6. prohibits levying any such in Wales, or the marches, &c. Covel.
COMMOTAU, or CHUMSTON, in Geography, a town of Bohemia, in the circle of Saaz. Large quantities of alum are prepared here. It is distant 10 miles N. W. of Saaz. 49° 8' of Drefden, and 42° N. of Prague.

COMMUTE, an ancient term in Wales, denoting half a hundred, or hundred; containing fifty villages, Stat. Wallia, 12 Ed. I.

Wales was ancienly divided into three provinces; each of these sub-divided into cantred; and every cantred into two commotes, or half hundreds.

Silvretta Girald, however, tells us, in his Itinerary, that a commote is but a quarter of a hundred. Commote also signifies a great dignitary or lordship, and may include one, or divers manors. Co. Litt. 5.

COMMOTION, an interline motion, or inclination in the parts of any thing.

In medicine, the term is chiefly used for a blow, or shake of the brain. A convulsion is a commotion of the fine medullary fibres of the brain. A fall occasions a commotion, whence frequently arises a counterfeit stroke on the opposite part; which occasions sometimes a contra-fall, and at other times a rupture of the veils, and an impulsion, by shaking the whole mass of the brain.

COMMUNA, or COMMUNES. See APPROPRIE, &c.

COMMUNANCE, a name formerly given to the commoters, or tenants and inhabitants, who had the right of common or communing in an open field, &c. Cowley.

COMMUNE, in the present organisation of France, denotes the subdivision of a canton, including sometimes a single town, and sometimes an union of several villages, possessing a mayor, and a communal munificence. All the considerable cities are divided into several communes.

COMMUNE Concilium Regni Anglie, denotes the common council of the king and people assembled in parliament.

COMMUNE Rectum. See Rectum.

COMMUNEM Legem, Writ of Entry ad. See L. GEN.

COMMUNIA Placita non tenenda in fececarion, an ancient writ directed to the treasurer and barons of the Exchequer, forbidding them to hold pleas between "commun perpons," (i.e. not debtors, to the king, who alone originally sued and were sued there) in that court, where neither of the parties belong to the same. Reg. Org. 187. But little obedience would be now paid to such a writ, if any officers were to dare to issue it? for the court of Exchequer seems, by precept, to have attained a concurrent jurisdiction in civil suits with the other courts in West munster-hall.

COMMUNIBUS Locis, a Latin term, in frequent use among philosophical, &c. writers; implying some medium, or mean relation between several places.

Dr. Keil supposes the ocean to be one quarter of a mile deep, communibus locis, q. d. at a medium, or taking one place with another.

COMMUNIBUS Annis, has the same import with regard to years, that communibus locis has with regard to places.

Mr. Derham observes, that the depth of rain, communibus annis, i.e. one year with another, were it to fluctuate on the earth, would amount to, at Townly in Lancashire, 4 3/4 inches; at Upminster, in Essex, 1 1/4; at Zurich, 3 1/2; at Pisa, 3 1/2; and at Paris, to 19 inches.

COMMUNICANS Arteria Cerebri, in Anatomy, is a branch of the internal carotid artery, which joins with a branch of the profunda cerebri, to form the circle of Willis. See Arteries.

COMMUNICATING, in Theology, the act of receiving the sacrament of the Eucharist.

Those of the reformed, and of the Greek church comme-
always be made within the line of circumvolution, for the safety of those who partake and receive.

Communication of Idioms. In Theology, the act of imparting the attributes of one of the natures in Jesus Christ to the other.

The communication of idiom is founded on the supposed union of two natures in the person of Christ: by this communication of idiom it is, that some divines say, God suffered, died, &c., which is strictly understood of the human nature; and signifies that God suffered in his humanity, that he died as to his human nature, &c.

The Lutherans carry the communication of idiom so far, as to say, that Jesus Christ is not only in his divine nature, and by reason of his divine person, but also really and properly in his humanity, immortal, &c., &c.

Communication of Motion, that act of a moving body, whereby another body at rest is put by it in motion, or a body already in motion is accelerated.

F. Malebranche looks on the communication of motion as something metaphysical; i.e., it is not necessarily arising from any physical principles, or any properties of bodies, but flowing from the immediate agency of God: there being, according to him, no more connection, or dependence, between the motion or rest of one body, and that of another, than between the form, colour, magnitude, &c., of one body, and those of another. The motion of one body, therefore, on his principle, is not any physical cause of that of another. See Cause.

The communication of motion results from, and is an evidence of the impenetrability and inertia of matter as such: unleas we admit the hypothesis of penetrable matter, advanced by M. Boerovitch and Mr. Michell, and ascribe to the powers of repulsion those effects which have been usually attributed to its solidity and actual resistance. See Matter.

Action, and re-action, sir Isaac Newton demonstrates, are equal and opposite; so that one body striking against another, and thereby occasioning a change in its motion, does itself undergo the very same change in its own motion, the contrary way. See Motion.

Hence, a moving body striking directly against another at rest, the one loses just as much of its motion as it communicates to the other; and they will proceed with the same velocity as if united into one mass. For the laws and quantity of motion so communicated, either in elastic or non elastic bodies, see Collision.

Communication, communicatio, in Rhetoric. See Anacolouasis.

COMMUNI Custodia, in Law, a writ which recently lay for the lord, whose tenant holding by knight's service died, and left his escheat fon under age, against a stranger that entered the land, and obtained the ward of the body. F. N. D. 80. Reg. Orig. 1611. Since the 11th 12. Car. II. c. 24, hath taken away wardships, this writ is of no use.

COMMUNION, in Theology, an uniform belief in several persons; whereby they are united under one head, in one church. See Unity, Uniformity, &c.

In this sense, the Lutherans, Calvinists, &c., are said to have been cut off from the Romish communion.

This is the primitive use of the word communion, as appears from the canons of the council of Elvira.

Though the term has been more extensively applied to denote a general agreement in matters of doctrine, discipline, and worship. And unless the term be understood in this large sense, so various are the opinions of men, there could be no communion among the members of any one church on earth.

Communion is also used for the act of communicating, or participating of, the sacrament of the Eucharist. The fourth council of Latrun, in acts, that every baptister shall receive the communion, at least, at Easter; which seems to import a tacit desire, that they should do it oftener; as, in effect, they did it much oftener in the primitive days. Gratian, and the master of the sentences, prescribe it as rule for the laity to communicate three times a year, at Easter, Whitsune, and Christmas. But in the thirteenth century, the practice was got on foot, never to approach the eucharist except at Easter; and the council thought fit to enjoin it then by a law, left their coldnesses and remissnesses should go farther still.

And the council of Trent renewed the same injunction, and recommended frequent communion without enforcing it by an express decree.

In the ninth century, the communion was still received by the laity in both kinds; or, rather, the species of bread which dipped in the wine, as it was owned by the Romanists themselves. Acta S. Bened. Sec. III. M. de Marca observes, that they received it at first in their hands. Hift. de Bern, and believes the communion under one kind alone to have had its rise in the West under pope Urban II. 1096, at the time of the conquest of the Holy Land. And it was more solemnly enjoined by the council of Constance in 1414.

The twenty-eighth canon of the council of Chalons enjoins the communion to be received under both kinds, distinctly; adding, however, two exceptions; the one of necessity, the other of caution, nijp fer necessitatem, & cautelam; the first in favour of the sick, the second of the sick, illtious, or those who had an aversion from wine.

It was formerly a kind of canonical punishment, for clerks guilty of any crime, to be reduced to lay communion, i.e., only to receive as the laity did, viz. under one kind.

They had another punishment of the same nature, though under a different name, called foreign communion; to which the canons frequently condemned their bishops, and other clerks. This punishment was not confined to the communion, or dispensation; but a kind of suspension from the functions of the order; and a degradation from the rank they held in the church. It had its name because the communion was only granted to the criminal on the foot of a foreign clerk, i.e., being reduced to the lowest of his order, he took place after all those of his rank, as all clerks, &c., did in the churches to which they did not belong. The second council of Agnada orders every clerk that abandons himself from the church, to be reduced to foreign communion.

Communion, Monstrance. Some instances occur in the early ages of the church, of the practice of adorning the eucharist to infants; and some few have imitated this practice in more modern times. Mr. Pfeiler pleads the use of it even to this day among the Greeks, and in the Bohemian churches till near the time of the Reformation; and he refers to the usage of the ancient churches, recorded by Phinis, Augutin, and Cyprian. He urges from Scripture the right which children have to all the privileges of which they are capable, as well as the Jewish children under the law, who were allowed to eat of the passover, and other sacrifices. To which it has been answered, that the sacrifices, of which they were allowed to partake, were chiefly peace offerings, which became the common food of the family, and were not considered as acts of devotion in such a degree as the eucharist. He replies to the objection founded on the incapacity of infants to examine themselves and discern the Lord's body, by observing that the precept extends only to those who were capable of understanding and complying with it; on the same ground that faith is required previous to baptism. Bishop Bedell suggests the following inquiry relative to this subject; what necessity of baptising infants.
infants, if their baptism produces no effect till they come to years of discretion? To which he replies, though the most principal effect be not attained presently, the less principal are not to be refused: fo children were circumcised, who could not understand the reason of it, and the same also did eat the passover: and fo did children baptized, in the primitive church, communicate in the Lord's supper: which I know not (says he) why it should not be so still: de quo phatis. It has been alleged, that the foundation of this practice was a mistaken apprehension of the absolute necessity of this ordinance in order to salvation, resulting from an erroneous interpretation of John vi. 53. See Bishop Newby's Letter to Dr. Ward, in p. 442 of Archbishop Usher's Life by Parr. Pierce's Essay on the Escorial. Wall's Hist. of Infant Baptism, part ii. chap. 9. § 15 and 16. Waterland's Review of the Doctrine of the Escorial, and preface to his two volumes of Poliphrenous Sermons, p. 35, &c. and Inquiry concerning Infant Communion, vol. ii. p. 75, &c.

Communion service, denotes that part of the liturgy of the church of England which relates to the administration of the sacrament. See Liturgy.

Communion table. See Altar.

Communis capsula. See Capsula.

Communis dutia cholecocius. See Ductus.

Communis digitorum manus extensor. See Extensor.

Communis latusorum depressor. See Depressor.

Communis latusorum elevator. See Elevator.

Communis mifericordia. See Misericordia.

Community, a society or body of men united together under certain common laws, agreed on among themselves, or imposed by a superior. The Romans, who seem to have given the first hint of communities to the several nations into which their empire was divided, doubtless borrowed it from some rules of their neighbours: they call them collegi; which term, among them, had nearly the same signification with community among us. For an account of the introduction and establishment of communities in Europe, see Charters of Community and City. See also Corporation and Coadjuration.

Communities now are of two kinds, ecclesiastical and laity; the first are either secular, as chapters of cathedral and collegiate churches; or regular, as convents, monasteries, &c.

Lay communities are of various kinds; some contracted by a fixed abode of a year and a day in the same place; others formed by the discharge of the same office, the profession of the same art, or attending the same place of worship, as those of parishes, fraternities, &c.

Accordingly, the word is commonly understood of pious foundations for the support of several persons, either in a secular or regular life; as colleges, abbeys, convents, priories, seminaries, hospitals, inns, &c.

Community is more particularly used in the French law, for the joint property in goods between the husband and the wife: the result of which is, that during marriage they are equally entitled to all effects, and liable to all debts, contracted either before or under marriage.

Community is a species of succession, and the acceptance of community refumbles an additio hereditatis.

Community was fet on foot in favour of the wives, to enter them as sharers in their husband's effects.

In countries where the civil law obtains, this community has no place, nor even in several customary countries, as being reputed a burden on the man.

Antiquity, the woman's share in the community was only one-third; and this appears till the fente of the law among us, the widow at the decease of her husband, being only intituled to one-third part of the moveables.

Community, continued, in the French Law, is that which subsists between the survivor of two persons joined in marriage, and the minor children of that marriage, when the survivor has not made an inventory of the effects in possession during marriage. The widow may either renounce community with her children, or continue it.

Community, tacit, is a community contracted between a man and woman, by the mere meeting of their effects, provided they have lived together the space of a year and a day: this community, being, indeed, is now abolished.

Community, Charters of. See Charters of Community.

Community of Goods, as it has been sometimes denominated, signifies a practice which was adopted for a short time in the primitive church, and which consisted principally in a common use, derived from an unbounded liberality, that induced the opulent to share their riches with their indigent brethren. The rich supplicated the wants of their numerous brethren with such liberality and promptitude, that, as St. Luke tells us (Acts ii. 4. iv. 32.) among the primitive disciples of Christ, all things were in common. This expression, however, has been greatly abused, says Molheim (E. H. vi. p. 60), and has been made to signify a "community of rights, goods, and possessions," than which interpretation nothing is more groundless, nothing more false. From a multitude of reasons, as well as from the express words of St. Peter (Acts v. iv.) it evidently appears, that the community which is implied in mutual use, and mutual liberality, is the only thing intended in this passage. This is very clearly and satisfactorily proved by Molheim, in a dissertation concerning the true nature of the community of goods, which is said to have taken place in the church of Jerusalem. This learned discourse is to be found in the second volume of his excellent work entitled "Discertationes ad Historiam ecclesiasticam pertinentes." Mr. Gibbon (see Hist. Decl. and Fall of Rom. Emp. vol. ii. p. 541) has given a very uncandid and unjust statement of this ancient Christian practice, and instead of considering it as honourable to the liberality and mutual benevolence of the first disciples, he seems to attach reproach and cenfure to it; when he suggests that the community of women, and that of temporal goods, may be considered as inapplicable parts of the same system. He also observes that it was of the same kind with that which had so agreeably amusèd the imagination of Plato, and which furnished in some degree the idea of the aulcrea fecl of the Elymians; although it was undoubtedy of a very different nature. This author further adds, that the progres of the Christian religion relaxed, and gradually abolished this generous institution, which, in hands less pure than those of the apostles, would too soon have been corrupted and abused by the returning selfishness of human nature; and the converts who embraced the new religion were permitted to retain the possession of their patrimony, their legacies and inheritances, and to increase their separate property by all the lawful means of trade and industry. Bishop Watson (see his "Apology for Chriftianity," 1708) has justly observed, that the expression "permitted to retain," in ordinary acceptance, implies an antecedent obligation to part with; but, as he adds, we have no account in scripture of any such obligation being imposed upon the converts to Chriftianity, either by Chrift himself, or by his apostles, or by any other authority: nay, in the very place
where this community of goods is treated of, there is an expext proof to the contrary. When Peter was about to insemi
ity as an exemplary punishment upon Ananias (not for keeping back a part of the price, as some men are fond of representing it, but) for his lying and hypocrisy, in offering a part of the price of his land as the whole of it; he said to him, "Whilst it remained (unfold) was it not thine own? and after it was sold, was it not in thine own power?" From this account it is evident, that Ananias was under no obligation to part with his patrimony; and after he had parted with it, the price was in his own power; the apostle would have permitted him to retain the whole of it, if he had thought fit; though he would not permit his prevarication to go unpunished.

Pythagoras not only taught his disciples to be contented with a little, but even deprived them of all command over their own property, by ceding the possessions of each individual to a common flock, to be distributed by proper officers, as occasion should require. From the time of this equitable division of their goods, as long as the natural inhabitants of this spot, and they lived upon the footing of perfect equality, and sat down together daily at a common table. If any one, however, repented of the connection, he was at liberty to depart, and might reclaim, from the general fund, his whole contribution.

**COMMUNITY of the kingdom. See Commonalty.**

**COMMUTATION, in Aeronomy. Angle of Commutation.** is the distance between the sun's true place seen from the earth, and the place of a planet reduced to the ecliptic. See PLACE.

Thus the angle ESR (Plate V. Aeronomy, fig. 11.) subtended between the sun's true place, E, viewed from the earth at S, and that of a planet reduced to the ecliptic, R, is the angle of commutation. The angle of commutation, therefore, is found by subtracting the sun's longitude from the heliocentric longitude of the planet R; or contrary.

**COMMUTATION, in Law, a change of a penalty, or punishment, viz. of a greater for a less, &c. as when death is commuted for, by bonds, as long as the natural inhabitants of this spot, and they lived upon the footing of perfect equality, and sat down together daily at a common table. If any one, however, repented of the connection, he was at liberty to depart, and might reclaim, from the general fund, his whole contribution.**

Some doubt whether the word be properly applied to any change but that of punishment; others will have it indifferently serve for the exchanging, or trucking of any thing.

**Commutation Act.** an act passed during the session of parliament in 1784, as part of a system for the prevention of smuggling; so called because, whilst it gave up the existing duties and excise on teas, it proposed an additional tax on windows, not as a new tax, but as a commutation for the portion of the duties on tea which it surrendered. The plan of the framers of this bill was to take off all the excise duty on tea, and impose a custom duty of 1 l. 10 s. on Bohea tea, which, it was apprehended, would ruin the smuggling trade in that article. On the finer kinds of tea, a higher duty would be laid; 15 l. per cent. on fouchong, &c.; 20 l. on fingo and hyfon; and 30 l. on congo. The total annual importation of teas into Europe amounted to about 15,000,000 lbs., above two-thirds of which quantity were consumed in Great Britain and Ireland, though the legal importation was not quite 6,000,000; consequently the quantity annually smuggled must have been above 7,000,000 lbs. According to this calculation, the people of England were considerably under-rated at the number of 6,000,000. Of thofe it was said that 9,000,000 would be relieved from the payment of the present duty on tea, without being obliged to contribute a farthing towards the tax which would be proposed as a substitute: the other 4,000,000, it was calculated, would, one with another, consume 3 lbs. of each tea in the year, for each pound of which, they, at this time, paid on an average 8 l. 7 d. duty; this duty, or the principal part of it being taken off, they, of course, afford to pay a substituted tax, which was proposed to be raised in the following manner:

On every house with seven windows, which house was also rated to the house tax, it was intended to lay an additional tax of 3 l. and 10 s. for every house of eight windows; 4 l. for those of nine windows; 6 l. 8 d. for those of ten windows, and so on, adding 2 l. 6 d. for each window up to 14, and full rising up to 180 windows, for which 20 l. per annum should be paid, over and above the duty at present paid on windows and houses. This regulation was calculated to produce above 700,000 l. so that with the new duty on tea, the produce would be near 900,000 l.

It was suggested that, according to this plan, the public revenue would be a considerable gainer, and the people at the same time have no reason to complain of additional burdens. In England, Scotland, and Wales, it was calculated that there were about 609,000 houses, which might be divided into the following classes:—286,593 houses under seven windows; 211,493 houses having from 8 to 10 windows; 38,524 of 11 windows; 24,170 from 12 to 15; 67,672, from 14 to 19; 52,625, of 20 windows and upwards; and 17,732 houses in Scotland. Of these about 200,000 as being excluded from the house-tax would pay nothing to this new tax, and the inhabitants being of the poorer sort, would be wholly delivered from the duty on tea. This regulation, it was supposed, would check, or rather absolutely ruin, the smuggling trade; besides being productive of other benefits to the fair trader, and particularly to the East India Company. Against this bill, which, however, passed into a law, many objections have been urged. To the East India Company, it has been argued, this with the new duties on teas, the house which the public were to derive from it are less obvious and certain. It has been said that those householders who were to be charged with the new rate for windows were precisely the persons who should have received the reciprocal benefit of the commutation; but that the reverse of this is undoubtedly the case; they who do not pay the new window-tax, or indeed any window-tax at all, being the only persons who share among them any little advantages that have accrued from the agreement. The facts are these:—Of the five different sorts of teas consumed by the public, there are three which are chiefly used by those who pay the new window-tax, viz. congo, fouchong, and hyfon. The price of the two former of these (which are the most used of the three) has been so incomparably reduced, as to afford nothing like a pecuniary compensation for the additional window-tax, and the price of the third sort, hyfon, which is the dearer and the least used, though rather more reduced, is still wholly disproportionate to the promised commutation. The only two sorts of tea, therefore, where the reduction of price is at all considerable, are bohea and fingo; and those are in general consumed by the lower orders of people only. From these facts it has been inferred, that they who pay the new tax consume those sorts of tea, from which not one-fifth of the proposed faving arises; while they who do not pay any tax at all, or at most a small portion of it, consume those species of tea upon which almost the whole of the faving, or at least upwards of four-fifths of it arises. The act has been deemed, by those who
who frenzously opposed it, unjust in its principle, and oppre- 
sive in its operation.

COMMENA, Anna, in Biography, daughter of the em- 
peror Alexius Comnenus, flourished about the year 1175, 
and wrote fifteen books upon the life and actions of her 
father, which she called the ‘Alexiad.’ She has been 
acclaimed of a too great partiality in favour of her hero, 
for which, considering her near relationship, the may claim an 
indulgence. This work was published with a Latin transla-
tion in 1691, and again in 1670; to this last edition are 
added notes historical and philological by the learned Du 
Trefn.

COMMENO, in Geography, a town of European Tur-
key, in the province of Albania; 35 miles S.E. of Alba-
nano.

COMO, Da, Fra. Emanuella, in Biography, so 
called from the place of his nativity, a considerable town in 
the state of Milan, was an historical painter, whose tale for 
the art was first called forth upon his seeing some painters at 
work in the cathedral of Como. Without the direction of 
any master, he afterwards attained some degree of eminence.
His works, however, are of very unequal merit; he painted 
in the refection of a convent at Como a ‘Last Supper,’ 
by which but an indifferent idea of his talents could be 
formed, were not his character retrieved by an excellent pic-
ture in the church representing a Pietà with Santo. He 
died aged 76, in the year 1521. Orlandi. Lanzì, Storia 
Pittorica.

Como, in Geography, a strong, populous, and commer-
cial town of Italy, and capital of a district in the Milanese, 
built by the Gauls, under the conduct of Brennus, situated 
at the south end of a lake to which it gives name, in a plain, 
almost surrounded with mountains. The town is encom-
passed by a wall, guarded with picturesque towers, and 
backed by a conical eminence, on which stand the ruins of 
an ancient wall. The houses are almost wholly built of 
one; and the cathedral is a handsome edifice of white 
marble, hewn from the neighbouring quarries. The inhabi-
tants have established several manufactories of cotton 
and silk, and carry on some trade with the Genoese. This 
town being distinguished as the birth-place of Pliny the younger, 
his statue is placed in a niche on the outside of the church, 
and has a Latin inscription bearing the date of 1193. It is 
distant 20 miles N. of Milan, in lat. 45° 44' E. long. 
8° 57'.

Como, Lake of, a lake in Italy in the Milanese, on the 
confines of Switzerland, about 32 miles long and 88 in cir-
cumference. At first it is scarcely a quarter of a mile broad, 
but it widens near a neck of land upon which is situated the 
small village of Turin. Towards the south it is divided into 
two branches, at the end of one of which stands Como, and at 
the end of the other Lecco. The river Adda passes through 
it, and several country houses and villages are situated on 
its banks, which are adorned with vines, chesnuts, and 
almend-trees. The neighbourhood of Turin, and the dis-
tricts bordering the lake of Como, supply, for the moat part, 
those Italian emigrants, who wander through Europe 
vending barometers and thermometers, of whom numbers 
annually resort to England.

COMOCLadia, in Botany (from Κόμος, comus 
fun; and Κλάδος, ramus; so called because the branches 
have a tuft of leaves at the end, bearing a fancied refer-
blance to a head of hair.) Linn. Gen. 49. Schreb. 66. 
Lam. Ill. 67. Willd. 82. Juss. 370. Vent. 3. 444. Clas 
and order, trilandra ungenymin. Nat. Ord. Terebinthacca; 
Jull. Vent. 

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COM

Gen. Ch. Calyx one-leaved, three or four cleft, spread-
ing, coloured; segments roundish. Cor. Petals three or 
four, roundish-egg-shaped, acute, flat, widely spreading, a 
little larger than the calyx. Stam. Filaments three or four, 
awl-shaped, shorter than the corolla; anthers roundish, in-
cumbent. Pfyl. Germ superior, egg-shaped; style none; 
fruit obtuse, simple. Peric. Drupes oblong, somewhat 
curved, marked at the top with three dots; membrana-
ous, the form of the drupe. Seed single.

Eff. Ch. Calyx three, rarely four-cleft. Petals three 
or four. Drupe oblong; with one seed.

Bigna superior, pendulous, always with a few quadri-
foil-translucent flowers intermixed with the others. A native 
of Jamaica, and St. Domingo. It abounds in a watery, 
flightly glutinous juice, which grows black when exposed 
to the air, and stains the hands so far as scarcely to be wash-
ed off. The wood is hard, of a fine grain, and reddish 
tab. 253. fig. 2. "Leaves egg-shaped, acute, toothed, 
shortly pubescent, venous and villous underneath." A tree 
much like the preceding Trunk upright with few branches. 
Leaves a foot and half long, in tufts at the ends of the 
branches; leaves from thirteen to twenty-one, oblong, 
cuneate, blunting above, edged with prickly teeth. A 
native of Cuba. It's juice is milky, glutinous, turning very 
black in the air, durably masting woollen and linen cloth, 
corrodin the 4em and rendering it scaly, smelling like 
liver of sulphur, or the human excrement. The nati-
ves have an idea that to sleep under it is dangerous. 3. 
I11. tab. 27. fig. 2. (C. triculifolia; Nouv. Act. Acad. 
Paris, 1784, p. 347; 'lex dodonae; Linn. Dodonae; 
Plum. Gen. 20. tab. 118. fig. 1.) "Leaves roundish angu-
ar-spinous, smooth on both sides." Leaves leafy, rigid, 
in crowded pairs terminated by an odd one. Flowers com-
paratively few; panicule very slender; racemes generally 
simple. A native of the West Indies. La Marec's figure 
was taken from a dried specimen. Wilkerson has both an 
illucifolia and an angulofia, quoting for the latter La Marec's 
figure in opposition to La Marec himself. His error seems 
to have been occasioned by mistaking the synonym from 
Plumier, given by Linnaeus, as a spinelike variety of his lex 
dodonae, which Wilkerson read D. aquifolii folio angulofia 
aculeata, instead of non aculeato, as it stands in the spe-
cies plantaram.

Propagation and Culture.—The first two species have 
been propagated in England, by seeds obtained from their native 
climate. They require the same treatment as other tropical 
plants.

COMO, Andrea, in Biography, an historical painter, 
who was born at Florence in 1560. He became at once the 
disciple and companion of Ludovico Cigoli, and was ranked 
amongst the best Florentine artists of his time, but the ex-
Bb
treme difficulty which he found in satisfying himself with his own productions, has occasioned their number to be very small, considering the great age to which he lived. After having gone through the regular routine of academic study, he went to Rome, where he spent many years, and painted several frescoes, particularly one in the tribunal of the church of St. Vitale, a composition of many figures, representing Christ bearing his cross, and on each side figures of martyrs. One of his most celebrated easel pictures was a "Magdalen in the Desert," for which the cardinal Barchini presented him with five hundred crowns, a very large price in those times. His pictures of "Madonas" are very highly esteemed for the beauty of their colouring and the delicacy with which they are finished, and above all for an elegance and lightness of form, joined to an expression of virgin modesty peculiarly their own. His numerous copies of the pictures of Coreggio, and other great masters are much esteemed. He died in the year 1658. Baldinucci.

LANZI, Storia Pittorica.

COMOMBO, in Geography, of the hill of Ombo, anciently Onobor, a town of Egypt, situated to the south of Thebes and on the same side of the river, where are still seen considerable ruins of an ancient temple. The inhabitants of this place were famous for the worship of the crocodile, which they fed in their ponds (according to Plutarch), where they became so tame, as to obey when they were called.

COMONAYA, a town of European Turkey, in the province of Macedonia; 66 miles N.N.E. of Akra.

COMORIS, in Ancient Geography, a town of Affyria, according to Ptolemy.—Allo, a town of Asia Minor, famenamed Abodora.—Allo, a town of Asia Minor, in Phrygia Sultaris, famenamed Merus, the same with Myrus.

COMORA ISLE, in Geography, are African islands in the Indian ocean, between the north-end of the island of Madagascar and the coast of Zanguebar, generally reckoned five in number, Johanna, Mayotta, Mohilla, Angazi, Comora, though some enumerate three, others four, and others eight, between the 41st and 46th degree of E. long. and the 10th and 11th of S. lat, at an equal distance from Madagascar and the continent of Africa. The largest is Johanna, which is. As the Comora isles abound in horned cattle, sheep, hogs, a variety of fruits and rice, they strive to refresh the European shipping to and from India. The inhabitants are negroes of the Mahometan religion; but they entertain the European seamen with great humanity.

COMORA, one of the fore-mentioned islands, which gives name to the whole cluster, about 6 leagues long, and three wide, but little known. S. lat. 11° 50'. E. long. 42°.

COMORIN, CAPS, the southernmost part of the southern Hindooftan, N.W. of the island of Ceylon. Though not above nine miles in extent, this promontory unites the two opposite seaboards of the year, owing to a ridge of mountains called the Ghauts, on the south side of which trees are laden with blofdom and fruit, while on the north side, the same fort of trees are stripped of all their leaves. N. lat. 8°. E. long. 77° 32'.

COMORN, COMORRA, LAT. a town of Hungary, and capital of a district, to which it gives name. It is so well defended by a fortress that the Turks could never take it. Its chief inhabitants were Hungarian, or Rascians, who belong to the Greek church. In 1783 it was almost wholly destroyed by an earthquake; 36 miles S.E. of Pecsburg, and 24 S.E. of Vienna.

COMORTH. See COMMORTH.

COMOSI, in Botany, the thirty-sixth natural order in the Philosophia Botanica of Linnaeus, which he afterwards abolished. It contained only spirea, filipendula, and aruncus. These are now all united in spirea, and the genus referred to the order rosacea.

COMOSANDALOS, in Antiquity, a crown of flowers worn in the festival CTHONIA.

COMOUCKS, in Geography, the Tartar inhabitants of Comania or Daghastan in Asia, under the protection of Persia. They are ferocious robbers. Every town has a chief named Myso, and the head of those chiefs chosen from among themselves is called Schmbul.

COMPACH, a rivet of Carnithia, which runs into the Moil, near Vellach.

COMPACT, in Physics, is a relative term, denoting a body to be close, dense, and heavy; having few pores, and those small ones. The heaviest metals, as gold and silver, are the most compact. See Gravity.

COMPACT, in a Legal Sense, signifies an agreement, or a contract, stipulated between several parties. A compact carries with it an obligation equal in point of confidence to that of a law; but the original of the obligation is different. In compacts, we ourselves determine and promise what shall be done, before we are obliged to do it; whereas in laws, we are obliged to act without our selves determining or promising at all. See Contract.

COMPACT is also the name of a celebrated bull, confirmed by pope Paul IV. relating to the cardinals.

In virtue of the bull of compa&c, cardinals can only confer benefits in their natural state; i.e. regular benefits on regulars.

COMPAGIES circularis montium, a term devised by Kircher to express what he in other places calls the annularity, or annual disposition of Mountains, which he says are in continued chains, forming belts or ridges in the manner of spines, all round the globe of the earth, from north to south, and so on from that point to north again, and in the same manner from east to west, and from west to east again.

COMPAGNE, Fr. The cabin of the commander or chief of a galley.

COMPAGNIES aux Garde. These were the companies of infantry that composed the regiment of French guards, making part of the householf troops of the king for the exterior guard. And it was usual to say captive aux Garde, lieutenant aux Garde, &c.

COMPAGNIE Ecossese. See Gendarmerie aux Garde du Corps.

COMPAGNIES d'Ordonnance. These were companies that never formed corps or regiments, like the gendarmeries, the light horse, the musketeers, &c.

COMPAGNIES des Garde. The four companies of horse-guards made part of the troops of the householf of the kings of France for the interior guard. Thus, in speaking of that corps, it was usual to say, a captain of the guards, a lieutenant of the guards, &c. It was customary to speak in the same manner of Swiss guards.

COMPAGNIES Francaises. Fr. These free companies were not regimented, but in time of war were put on a certain establishment. Each of them had a chief, who commanded it. They were generally composed of dragoons, hussars, and foot soldiers. All those who served in these corps or companies were called partisans. They were employed in making incursions into the enemy's country, and laying it waste as much as they could. An officer, who had served some campaigns as a partisan, could not easily afterwards serve with regular troops. They are a sort of voluntary pirates, who know no kind of subordination but that which is peculiar to themselves. When these troops have chiefs that
that are hardy, brave, and intelligent, they render important
services to armies.

**COMPAGNIE du Gout a pied.** See the article **MARÉ-
chaussée**.

**COMPAGNIE du Lieutenant criminel de Robecourt.** See also
the article **MARÉCHAUSSEE**.

**COMPAGNIE d’Ordinance a cheval.** See the same ar-
ticle.

Independent company is one that is not incorporated into
a regiment. Two such companies generally belong to each
regiment in England, for the purpose of supplying the regi-
mants with recruits.

**COMPAGUS, in Antiquity, a kind of summer-floé worn
by the Roman senators, consisting only of a sable at the bot-
tom; it was fastened with fasteners, crossed one ano-
other many times about the leg.

Rubenius makes the *compagn* to have been a sort of caige
worn by the roman generals as well as senators. Under the
later emperors, in the middle age, we read of the same worn by
popes, bishops, and abbots.

**COMPANION of the Garter, an appellation distingui-
ishing one of the knights of that most noble order, at the
head of which is the king, as sovereign. Stat. 24 Hen.
VIII. c. 13. See Garter.

**COMPANY, a collective term, understood of several
persons assembled together in the same place, or with the
same design. See Society.

The word is formed of the French compagnie, and that of
companions, which, Chifflet obseres, are found in the Saic law, tit. 65. and are properly military words, understood of soldiers, who, according to the modern phrase, are comrades, or men-mates, i.e. lodge together, eat to-
together, &c. of the Latin cum, with, and panis, bread.

It may be added, that in some Greek authors under the West-
ern empire, the word *kubernai* occurs in the sense of fo-

<table>
<thead>
<tr>
<th>Companies</th>
<th>Halls</th>
<th>Incorporated A. D.</th>
<th>Livery Charitable Gifts paid yearly, and Privileges, &amp;c.</th>
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</thead>
<tbody>
<tr>
<td>Mercers</td>
<td>Cheapside</td>
<td>Richard II.</td>
<td>1393 2 l 3 d 4 3000 Exclusive of 20 per cent, paid yearly to the widows of infirm clergy men during life, pursuant to a proposal accepted in 1698; when they settled annuities of 14,000l. a year for that purpose.</td>
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<tr>
<td>Grocers</td>
<td>Poultry, Croc., alley</td>
<td>Edward III.</td>
<td>1345 20 0 0 700</td>
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<td>Drapers</td>
<td>Throgmorton street</td>
<td>Henry VI.</td>
<td>1439 25 0 0 4000</td>
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<td>Fishmongers</td>
<td>Thames-street</td>
<td>Henry VIII.</td>
<td>1536 13 6 8 800</td>
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<td>Goldsmiths</td>
<td>Foller-lane</td>
<td>Richard II.</td>
<td>1395 20 0 0 1000</td>
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<td>Skinners</td>
<td>Dowgate-hill</td>
<td>Edward III.</td>
<td>1327 15 0 0 700</td>
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<tr>
<td>Merchant Taylor</td>
<td>Threadneedle-street</td>
<td>Edward IV.</td>
<td>1466 20 0 0 2000</td>
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<tr>
<td>Haberdashers</td>
<td>Maiden-lane</td>
<td>Henry VI.</td>
<td>1407 25 0 0 3500</td>
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<td>Salters</td>
<td>Swithin’s-lane</td>
<td>Q. Elizabeth</td>
<td>1578 20 0 0 500</td>
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<td>Ironmongers</td>
<td>Fenchurch-street</td>
<td>Edward IV.</td>
<td>1464 31 10 0 1800</td>
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<td>Vintners</td>
<td>Thames-street</td>
<td>Henry VI.</td>
<td>1437 31 13 4 600</td>
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<tr>
<td>Clothworkers</td>
<td>Mincing-lane</td>
<td>Edward IV.</td>
<td>1482 31 10 0 1400</td>
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**Company, in Commerce, is an association of several mer-
chants, or others, who unite in one common interest, and
contribute by their stock, their counsel, and study, to the
felling on foot, or supporting, of some lucrative estab-
ishment.

Though company and society, or fellowship, be in effect,
the same thing, yet custom has made a difference between
them; society, or partnership, being underlaid of two, or
three dealers, or not many more; and company usually of a
greater number. See Society.

A second difference between companies and societies is,
that the first, especially when they have exclusive privileges,
cannot be established without the concurrence of the prince;
and need letters patent, charters, &c. Whereas, for the
latter, the consent of the members, fixed and certified by
acts and contracts, and authorized by bye-laws, is suf-
ficient.

The several professions and trades exercized in the city of
London, being incorporated into distinct fraternities, govern-
ed by their particular laws, a tabular view of them may not
be unacceptable.

The abridgment of their incorporations, and particular pri-
vileges, is taken from the records of the Tower, &c. and
from the Firma-Burgi of Madox, the king’s historiographer;
the account of their charters from those eminent historians
Stow and Strype; and the lines of the livemans on ad-
million, are taken from the returns to the clerks of the
parliament, and the fictery-books made after the several
polls for the magistrates and representatives of the city.

The companies are here placed according to their prece-
dence, beginning with the twelve principal ones, of one or
other of which the lord mayors have generally made them-
theselves free at their election, if they were not so before; for
they are not only the oldest, but the richest, many of them
having had the honour of kings and princes to be their mem-
ers, and the apartments of their halls being fit to enter-
tain a monarch.
<table>
<thead>
<tr>
<th>Companies</th>
<th>Halls</th>
<th>Incorporated A.D.</th>
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<tr>
<td>13 Dyers</td>
<td>Elbow-lane</td>
<td>Edward IV. 1472</td>
<td>15 0 0</td>
<td></td>
</tr>
<tr>
<td>14 Brewers</td>
<td>Adde-street</td>
<td>Henry VI. 1438</td>
<td>6 13 4</td>
<td></td>
</tr>
<tr>
<td>15 Leather-sellers</td>
<td>Little St. Helens</td>
<td>Henry VI. 1442</td>
<td>20 0 0</td>
<td>* Hen. VII. made their wardens inspectors of sheep, lamb, and calves leather throughout the kingdom.</td>
</tr>
<tr>
<td>16 Pewterers</td>
<td>Lime-street</td>
<td>Edward IV. 1474</td>
<td>20 0 0</td>
<td>† By act of Parl. 25 Hen. VIII. their wardens had the inspection of pewter throughout England.</td>
</tr>
<tr>
<td>17 Barber-surgeons</td>
<td>Monkwell-street</td>
<td>Edward IV. 1461</td>
<td>10 0 0</td>
<td>† In the reign of Hen. VIII. the surgeons of this company, then but 19, were exempted by parliament from ward and parish offices, and from military service. They were incorporated separately by 18 Geo. II. cap. 15, and the company of surgeons had an elegant hall in the Old Bailey, with a theatre for the amusement of human bodies. They now form a royal college, and their house is in Lincoln's Inn fields.</td>
</tr>
<tr>
<td>23 Cutlers</td>
<td>Cloak-lane</td>
<td>Henry V. 1417</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>24 Bakers</td>
<td>Harp-lane</td>
<td>Edward II. 1327</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>29 Wax-chandlers</td>
<td>Maiden-lane</td>
<td>Richard III. 1483</td>
<td>5 0 0</td>
<td></td>
</tr>
<tr>
<td>31 Tallow-chandlers</td>
<td>Dowgate-hill</td>
<td>Edward IV. 1461</td>
<td>15 0 0</td>
<td></td>
</tr>
<tr>
<td>32 Armourers</td>
<td>Coleman-street</td>
<td>Henry VI. 1423</td>
<td>15 0 0</td>
<td>§ The brazier's are united to this company.</td>
</tr>
<tr>
<td>28 Gilders</td>
<td>Bafinghall-street</td>
<td>Henry VI. 1449</td>
<td>5 0 0</td>
<td>§§ Q. Elizabeth incorporated the pinners and wire-drawers with them.</td>
</tr>
<tr>
<td>24 Butchers</td>
<td>Pudding-lane</td>
<td>James I. 1615</td>
<td>11 11 0</td>
<td>† This is an ancient fraternity of which we have an account in the reign of Henry II. A.D. 1180.</td>
</tr>
<tr>
<td>25 Saddlers</td>
<td>Cheapside</td>
<td>Edward I. 10 0 0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>27 Cordwainers</td>
<td>Ditlaff-lane</td>
<td>Edward III. 1344</td>
<td>8 0 0</td>
<td></td>
</tr>
<tr>
<td>28 Painter-Rainers</td>
<td>Little Trinity-lane</td>
<td>Henry IV. 1410</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>29 Carriers</td>
<td>Near Cripplegate</td>
<td>Q. Elizabeth 1382</td>
<td>14 0 0</td>
<td></td>
</tr>
<tr>
<td>30 Mafons</td>
<td>Bafinghall-street</td>
<td>James I. 1635</td>
<td>9 13 4</td>
<td></td>
</tr>
<tr>
<td>31 Plumbers</td>
<td>Near Dowgate-hill</td>
<td>Charles II. 1677</td>
<td>5 0 0</td>
<td></td>
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<tr>
<td>32 Tynholders</td>
<td>Elbow-lane</td>
<td>James I. 1611</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>33 Founders **</td>
<td>Lothbury</td>
<td>Henry VIII. 1515</td>
<td>10 0 0</td>
<td></td>
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<tr>
<td>34 Poulters</td>
<td>No hall</td>
<td>James I. 1614</td>
<td>8 0 0</td>
<td></td>
</tr>
<tr>
<td>35 Cooks</td>
<td>Hall burnt</td>
<td>Henry VII. 1504</td>
<td>10 0 0</td>
<td></td>
</tr>
<tr>
<td>36 Coopers</td>
<td>Bafinghall-street</td>
<td>Edward IV. 1483</td>
<td>10 0 0</td>
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</tr>
<tr>
<td>37 Tylers and bricklayers</td>
<td>Leadenhall-street</td>
<td>Henry VII. 1501</td>
<td>15 0 0</td>
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</tr>
<tr>
<td>38 Bowyers</td>
<td>No hall</td>
<td>Q. Elizabeth 1568</td>
<td>12 0 0</td>
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</tr>
<tr>
<td>39 Fletchers</td>
<td>St. Mary Axe</td>
<td>James I. 1616</td>
<td>5 0 0</td>
<td></td>
</tr>
<tr>
<td>40 Blacksmiths</td>
<td>Lambeth-hill</td>
<td>Q. Elizabeth 1777</td>
<td>8 0 0</td>
<td></td>
</tr>
<tr>
<td>41 Joiners and cickers</td>
<td>Thames-street</td>
<td>Q. Elizabeth 1569</td>
<td>8 0 0</td>
<td></td>
</tr>
<tr>
<td>42 Weavers</td>
<td>Bafinghall-street</td>
<td>Henry II. 1569</td>
<td>6 0 0</td>
<td></td>
</tr>
<tr>
<td>43 Woolmen</td>
<td>No hall</td>
<td>No charter</td>
<td>10 0 0</td>
<td>§ It is only a company by prescription.</td>
</tr>
<tr>
<td>44 Serrvicers</td>
<td>No hall</td>
<td>James I. 1616</td>
<td>5 0 0</td>
<td></td>
</tr>
<tr>
<td>45 Fruitiers</td>
<td>No hall</td>
<td>James I. 1603</td>
<td>5 0 0</td>
<td></td>
</tr>
<tr>
<td>46 Plaisterers</td>
<td>Addle-street</td>
<td>Henry VII. 1501</td>
<td>8 0 0</td>
<td></td>
</tr>
<tr>
<td>47 Stationers † †</td>
<td>Ludgate-street</td>
<td>Philip &amp; Mary 1557</td>
<td>20 0 0</td>
<td>† † This company, which also includes bookbinders, letter-founders, printers, and book-binders, have a stock which is employed in printing almanacks, primers, plasters, school-books, &amp;c. of which they have the sole privilege, by virtue of a grant from the crown. This stock consists of shares, which are distributed in different proportions among those who have lived, or served the office of renter-wardens: who, if they die married, devolve to their widows. They pay above 200l. a year in pensions and other charities. They are likewise trustees for the disposal of the considerable legacies of Mr. William Bowyer, a learned printer, (who died Nov. 18, 1778) consisting of 30l. a year to the most learned journeyman that can be met with; and 180l. a year in annuities of 20l. each to nine necessitous printers of sixty-three years of age or upwards; besides other charities.</td>
</tr>
<tr>
<td>48 Brederes</td>
<td>Gutter-lane</td>
<td>Q. Elizabeth 1591</td>
<td>5 0 0</td>
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<td>49 Upholders</td>
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<td>Charles I. 1627</td>
<td>4 10 0</td>
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<tr>
<td>50 Musicians</td>
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<td>James I. 1604</td>
<td>10 0 0</td>
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<tr>
<td>Company</td>
<td>Incorporated A.D.</td>
<td>Livery Charitable Gifts, paid yearly, and Privileges, &amp;c.</td>
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<td>Turners</td>
<td>No hall</td>
<td>The glaze painters are incorporated with them.</td>
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<tr>
<td>Bucket-makers</td>
<td>No hall</td>
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<td>Glaziers</td>
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<td>Loriners</td>
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<td>Spectacle-makers</td>
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<td>Framework-knitters</td>
<td>Red cross-street</td>
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<td>Silk-throwers</td>
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<td>Tin-plate-workers</td>
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</table>

**COMPANY.**

<table>
<thead>
<tr>
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</tbody>
</table>

**CARMEN,**

have no hall, nor charter, nor livery: but are a fellowship by act of common council, with the title of Free Carmen of the city of London, and have a master, 2 wardens, and 41 affiliates, under the direction of the lord mayor and aldermen. The cats that belong to this fellowship, which are betwixt 4 and 500, are, by an act of common council, subject to the rule of the president and governours of Christ's Hospital; to whom the owner of every cart pays 17s. 4d. a year for a licence to work it, and every cart is brought to the hospital to have a number in brass put upon it.

<table>
<thead>
<tr>
<th>Companies,</th>
<th>Incorporated A.D.</th>
<th>Livery Charitable Gifts, paid yearly, and Privileges, &amp;c.</th>
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<tbody>
<tr>
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<td>Longbow-string-makers</td>
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</tbody>
</table>
From the foregoing list, it appears on the whole, that there are ninety-one companies, forty-eight halls, and that the number of liverymen, according to the most exact account that could be procured, in 1779, was 8934, but this number is variable. The sums of money yearly distributed in charity by only twenty-three of the companies, amounts to more than 23,655 l.; and if but forty pounds each be annually given by the remaining sixty-eight companies, the whole will much exceed 26,575 l. per annum.

Company seems more peculiarly appropriated to those grand associations, yet on foot for the commerce of the remote parts of the world; as the English and Dutch East India company, South Sea company, Mississippi company, &c.; the rife and establishment of which, we shall here let before the reader.

However injurious companies with joint-stock, and incorporated with exclusive privileges, may, at this time, be reckoned to the nation in general; it is yet certain that they were the general parent of all our foreign commerce; private traders being discouraged from hazarding their fortunes in foreign commerce, until the method of traffic had been first settled by joint-stock companies. From this principle it is, that we find several nations that are now endeavouring to improve their trade, and to establish or increase marine power, by the means of joint-stock companies.

But since the trade of this kingdom, and the number of traders have increased, and the methods of assurance of shipping and merchandise, and the navigation to all parts of the known world have become familiar to us; these companies, in the opinions of most men, have been looked upon in the light of monopolies; their privileges have therefore been lessened from time to time, in order to favour a free and general trade; and experience has shewn, that the trade of the nation has advanced, in proportion as monopolies have been discouraged. When companies do not trade upon a joint-stock, but are obliged to admit any person properly qualified, upon paying a certain fine, and agreeing to submit to the regulations of the company, each member trading upon his own Stock, and at his own risk, they are called regulated companies. When they trade upon a joint-stock, each member sharing in the common profit or loss in proportion to his share in this stock, they are called joint-stock companies. Such companies, whether regulated or joint-stock, sometimes have, and sometimes have not, exclusive privileges. Regulated companies resemble, in every respect, the corporations of trades, so common in the cities and towns of all the different countries of Europe; and are a sort of enlarged monopolies of the same kind. As no inhabitant of a town can exercise an incorporated trade, without first obtaining his freedom in the corporation; so in most cases no subject of the state can lawfully carry on any branch of foreign trade, for which a regulated company is established, without first becoming a member of that company. Of companies of this kind we have had, or still have, in Great Britain, the Hamburgh company, the Ruffia company, the Eastland company, the Turkey company, and the African company. Regulated companies, as Sir Joshua Child has observed, though they had frequently supported public ministers, had never maintained any forts or garrisons in the countries to which they traded; whereas joint-stock companies frequently had. And in reality, says Dr. Smith, (Wealth of Nations, vol. iii. p. 116,) the former seem to be much more unit, for this sort of service than the latter; partly, because the directors of a regulated company have no particular interest in the prosperity of the general trade of the country, for the sake of which such forts and garrisons are maintained; whereas the private interest of the directors of a joint-stock company, is connected with the prosperity of the general trade of the company, and with the maintenance of the forts and garrisons which are necessary for its defence; and partly, because the directors of the latter company have always the management of a large capital, the joint-stock of the company, a part of which they may frequently employ, with propriety, in building, repairing, and maintaining such necessary forts and garrisons; whilst the
the directors of a regulated company, having the management of no common capital, have no other fund to employ in this way, but the casual revenue arising from the admission of goods, and from the corporation duties imposed upon the trade of the company for its benefit. A joint-stock company, established either by royal charter or by act of parliament, differ, in several respects, not only from regulated companies, but from private copartnery. In a private copartnery, no partner, without the consent of the co-partners, can transfer his share to another person, or introduce a new member into the company. Each member, however, may, upon proper warning, withdraw from the copartnery, and demand payment of his share of the common flock. In a joint-stock company, on the contrary, no member can demand payment of his share from the company; but each member can, without their consent, transfer his share to another person, and thereby introduce a new member. 2dly. In a private copartnery, each partner is bound for the debts contracted by the company to the whole extent of his fortune; whereas, in a joint-stock company, each partner is bound only to the extent of his share. The trade of a joint-stock company is always managed by a court of directors, which is frequently subject to a variety of respects, to the control of a general court of proprietors; but these proprietors, being for the most part totally exempted from trouble and from risk, beyond a limited sum, receive contentedly such half-yearly or yearly dividends, as the directors think proper to allot; and many persons are encouraged to become adventurers in joint-stock companies, who, would, upon no account, hazard their fortunes in any private copartnery. The directors of such companies being the managers rather of other people's money than of their own, it cannot well be expected, that they should watch over it with the same anxious vigilance with which the partners in a private copartnery frequently watch over their own. Negligence and profusion must always prevail, more or less, in the management of the affairs of such a company. It is upon this account that joint-stock companies for foreign trade have seldom been able to maintain the competition against private adventurers. They have, accordingly, very seldom succeeded without an exclusive privilege, and frequently have not succeeded with one. Without an exclusive privilege, they have commonly mismanaged the trade; with an exclusive privilege, they have both mismanaged and confined it. For other appropriate and just observations on this subject, in its reference to the African company, the Hudson's Bay company, the South Sea company, and the East India company, see Smith's Wealth of Nations, vol. iii. chap. 1.

When a company of merchants undertake, at their own risk and expense, to establish a new trade with some remote and barbarous nation, it may not be unreasonable to incorporate them into a joint-stock company, and to grant them, in case of their success, a monopoly of the trade for a certain number of years. It is the ancient and most natural way in which the trade can reconcile them for hazarding a dangerous and expensive experiment, of which the public is afterwards to reap the benefit. A temporary monopoly of this kind may be vindicated upon the fame principles upon which a like monopoly of a new machine is granted to its inventor, and that of a new book to its author. But upon the expiration of this term, the monopoly ought certainly to terminate; the forts and garrisons, if it was found necessary to establish any, to be taken into the hands of government, their value to be paid to the company, and the trade to be laid open to all the subjects of the state. Without a monopoly, however, a joint-stock company, as experience has shown, cannot carry on any branch of foreign trade. An eminent French author, of great knowledge in matters of political economy, the abbe Morelet, gives a list of 55 joint-stock companies for foreign trade; which have been established in different parts of Europe since the year 1660, and which, according to him, have all failed from mismanagement, notwithstanding they had exclusive privileges. Although he has been misinformed with regard to the history of two or three of them, which were not joint-stock companies, and which have not failed; yet there have been several joint-stock companies, which have failed, and which he has omitted.

The only trades which it seems possible for a joint-stock company to carry on successfully without an exclusive privilege, are those, of which all the operations are capable of being reduced to what is called a routine, or to such an uniformity of method as admits of little or no variation. Of this kind is, first, the banking trade; secondly, the trade of insurance from fire, and from sea-risk and capture in time of war; thirdly, the trade of making and maintaining a navigable cut or canal; and fourthly, the similar trade of bringing water for the supply of a great city. To render the establishment of a joint-stock company perfectly reasonable, with the circumstance of being reducible to strict rule and method, two other circumstances ought to concur. First, it ought to appear with the clearest evidence, that the undertaking is of greater and more general utility than the greater part of common trades; and, secondly, that it requires a greater capital than can easily be collected into a private copartnery. In the four trades above-mentioned both these circumstances concur.

The joint-stock companies, says this judicious writer, which are established for the public spirited purpose of promoting some particular manufacture, over and above managing their own affairs ill, to the diminution of the general stock of the society, can, in other respects, fear no evil to do more harm than good. Notwithstanding the most upright intentions, the unavoidable partiality of their directors to particular branches of the manufacture, of which the undertakers mislead and impose upon them, is a real discouragement to the rest, and necessarily breaks, more or less, that natural proportion which would otherwise establish itself between judicious industry and profit, and which, to the general industry of the country, is of all encouragements, the greatest and the most effectual.}

**COMPANY, African; sometimes called "Royal African Company,"** the name of the original institution. The first commercial voyage from England to the coast of Guinea was in 1556, but nothing like a company was formed till the year 1588, when queen Elizabeth granted a patent for ten years to come, to some merchants of Exeter, and other perfsons for an exclusive trade to the rivers Senegal and Gambia. In 1618, king James I. granted a charter for establishing a joint-stock company; but separate traders continuing to resort to the coast, the company was soon disdolved. Another company was erected by charter in 1631, which met with little success; and in 1651, the parliament granted a charter for five years to the East India company, for trading to the Gold coast in their way to India. The demand for negroes in the West India and American plantations increasing considerably, another exclusive African or Guinea company was incorporated in 1662, at the head of which was the duke of York, joined with many persons of rank and distinction. This company, like those that had preceded it, was unsuccessful, and its charter was soon after revoked by consent of the parties associated in the enterprise, in consequence of which another exclusive company
was incorporated by letters patent in 1672. They raised a capital of 111,000l. and improved the trade considerably; but at the revolution, the West India planters joined the separate trakers in asserting that they were always belved served with fites when the trade was free to all persons; and exclusive companies, whose privileges had not been sanctioned by parliament, were considered inconsistent with the declaration of rights, and the trade became open again; but all private traders were to pay 10 per cent. to the company, towards maintaining the forts and factories on the coast. This contribution was however found insufficient, and in 1730 parliament granted 10,000l. for the purpose, which was continued annually till 1744, when, in consequence of the war, 20,000l. was granted, and in almost every year since, a sum has been appropriated by parliament to this purpose.

As all the joint-stock companies which had been established for this trade had appeared incompetent to carry it on with advantage, it was in 1750 (3 Geo. II. c. 21.) transferred to a regulated company, the members of which are deemed a body corporate and politic, under the title of The Company of Merchants trading to Africa, but are prohibited from trading in their corporate capacity, from having any joint or transferable stock, and from borrowing money under their common seal. Any person intending to trade to Africa, may become free of this company on payment of forty shillings; and out of the monies thus received, a sum not exceeding 800l. is allowed for the salaries of clerks and agents at London, Bristol, and Liverpool, the house-rent of their office at London, and all other expences of management, commission, and agency in England. What remains of this sum, after defraying these different expences, they may divide among themselves, as compensation for their trouble, in what manner they think proper. The forts, factories, &c. possessed by the old company on the coast of Africa, are vested in the present company, who continue to receive an annual sum from parliament (generally about 13,000l.) for the support of these establishments: the sum granted in the year 1806 was 18,000l. For the proper application of this sum, the committee is obliged to account annually to the curator baron of the exchequer, which account is afterwards to be laid before parliament.

The company is under the management of a committee of nine persons, three being chosen for London, three for Bristol, and three for Liverpool, annually. The committee are enjoined to lay an annual account of the application of the money granted to them before parliament.

Although by the 4th of Geo. III. c. 20. the fort of Senegal, with all its dependencies, had been vested in this company, yet in the year following (by the 5th of Geo. III. c. 44.) not only Senegal and its dependencies, but the whole coast from the port of Saltee, in South Barbary, to Cape Rouge, was exempted from the jurisdiction of that company, and vested in the crown; the trade to it being declared free to all his majesty's subjects.

Before the establishment of the Royal African company, there had been three other joint-stock companies successively erected one after another, for the African trade. They were all equally unsuccessful. They all, however, had exclusive charters, which, though not confirmed by act of parliament, were in those days supposed to convey a real exclusive privilege.

Companies, English. The East India Company was established by charter dated Dec. 31, 1600, by which the earl of Cumberland and 215 other persons were authorized to carry on an exclusive trade to all parts of the East Indies, for 17 years; under the title of "The Governor and Company of Merchants of London trading to the East Indies." They raised 72,000l. in shares of 50l. each, and fitted out five ships, which accomplished their first voyage very successfully, in two years and seven months.

Having carried on the trade for about ten years, with different degrees of success, they obtained another charter dated May 31, 1610, by which the company was made perpetual. They had not yet adopted the mode of trading under one joint stock, but carried it on in several co-partnerships and lesser stocks. In 1613 the proprietors of the several separate stocks, united them into one general joint-capital; and notwithstanding some opposition to their trade, both at home, and abroad, they preferred and extended it, having at this time established factories at about twenty different places in India. In a vindication of the East India Company before the privy council, at a subsequent period, among other remarks for shewing the great difficulties attending an East India trade, it was asserted, that although they had a stock of 1,500,000l. yet in fifteen years time, viz. from 1617 to 1632, their whole profit was no more than 12 and one-half per cent.

In 1637, Charles I. established a new company to trade to China and Japan, but it was soon ruined. The old company likewise from its differences with the Dutch East India company, the encroachments of private adventurers, and other causes, fell into decay, and in 1655 it was dissolved by Cromwell, and the trade laid open. The merchants who followed obliged him to re-establish the company about three years after; their joint stock was now 7,595,824l., of which only one-half, or 3,796,912l. was paid in, and was properly their capital. The total exports of the company in three years, ending with 1660, was 227,828l. in bullion, and 23,763l. in merchandise. After the reformation, they obtained a new charter from Charles II. dated April 3, 1661. By this charter it appears that the company had not then one sole transferable joint-stock, but that every one, who was free of this company paid a certain sum of money to the company on the quitting out of their fleet, for which he had credit in the company's books, and received his proportionate dividend on the profits of the respective voyage. The whole investments were made by the company in their corporate capacity; but they were not established as an irrevocable corporation, as they might be dissolved in three years notice.

In 1664, the company's stock fell at only 73 per cent., but in consequence of an inquiry into the state of their affairs, the result of which was very favourable, the stock soon got up considerably. New charters were granted in 1669 and 1676, confirming all their privileges. In the latter year, the company having made a considerable profit by their trade, agreed, instead of making a dividend thereof, to add it to their capital stock, so as just to double the same, by which their capital became 7,595,824l. 102. In consequence of the extension and success of their trade, which enabled them to make large dividends, their stock in 1680 sold from 280 to 300 per cent; but these great profits, and the doubtful authority under which they held their exclusive privileges, (not having the sanction of parliament) being a great temptation to individual adventurers, interlopers, who had often given them much trouble, became again very numerous, and attempts were made to get the trade laid open, or to have it vested in a regulated company similar to those by which the trade with Turkey and with some other countries was then carried on. The company, however, in 1683 found means to obtain another charter, by which all their former privileges were confirmed, and they were empowered to seize the ships and merchandise of all interlopers, to raise and maintain military forces, to exercise martial law, and
and to establish a court of judicature for determining all mercantile causes, within their limits. In 1686 they obtained another charter granting them still greater powers and privileges.

Soon after the revolution much popular clamour was raised against the East India company; and in 1691 the house of commons addressed the king to dissolve the company and incorporate a new one; an opportunity for which soon occurred, as in 1693, the charter of the company became void, from their not paying the duty which had been imposed on their flock within the time limited by the act; but a new charter was granted them, on condition of submitting to such regulations as should be ordained before the 29th of September 1694 and which were contained in two charters soon afterwards executed.

In 1698 the complaints of the weavers of London against the importation of India wrong'd silks, and the company having been prevented by lollies from making any dividend for several years, brought it into much disrepute, and the house of commons thought it necessary to take the state of their affairs into consideration. The company thought it prudent to offer an advance of 700,000l. for the public service at 4 per cent. interest, provided the exclusive trade was legally settled on them; but a number of merchants, numerous, and in 1691 the company was incorporated in the exchequer, proposed to advance 2,000,000l at 8 per cent. interest, for similar privileges. The latter proposal was approved, and an act passed by which a new company was established; many difficulties however appeared, with respect to their engaging in the trade, till the expiration of the three years notice for determining the old company. During this unsettled state, the East India trade, the old company's stock had in about five or ten years fluctuated from 530 per cent. to only 37 per cent.

The great contentions which ensued between the old and new companies, soon rendered it obvious that little benefit would be derived from the trade, unless a coalition between the two rival corporations was effected. This was accomplished in 1702, by an agreement that the old company should purchase an equal proportion of stock in the new company, and that the separate traders, who had subscribed to the new company, but not to their joint-stock, should be included in the union. The old company was to keep their stock in the new company, in their corporate capacity for seven years, then to transfer it to their respective members, and resign their charter to the crown, from which time the new company comprehending the proprietors of both, assumed their present title of "The United Company of Merchants of England trading to the East Indies." In 1698 the term of their exclusive trade to India, which was determinable upon three years notice after 1711, and repayment of the sum they had advanced, was prolonged to three years notice after Lady-day 1726; for which they advanced to government 1,200,000l. without any additional interest. In 1712 they obtained an act for continuing the trade and corporation capacity of the company, although the sums they had advanced to government should be repaid; which repayment or redemption of their annual fund, was not to be made till the expiration of three years notice after Lady-day 1733.

The act of parliament being liable to a different construction from what was probably intended, and the term granted being near its expiration, a very powerful opposition to its renewal, was raised in 1730, and specious proposals were made to parliament for redeeming the fund of the company, and transferring the trade to a regulated company, with similar privileges. After a very full discussion of the subject, a new agreement was entered into with the company, who agreed to pay 200,000l. towards the service of the current year, and to have the interest payable to them by government reduced from 3 to 4 per cent.; in consideration of which all their exclusive privileges were continued till the expiration of three years notice, to be given after Lady-day 1766, when upon re-payment of their entire capital of 3,200,000l. their exclusive privileges were to cease, but the company to continue a corporation for ever, to enjoy the East India trade in common with all other. In consequence of this, the situation of the interest received from government, they thought proper to reduce the dividend payable to their proprietors from 3 to 7 per cent. and soon after to 6 per cent.

In 1743 the company proposed to advance 1,000,000l. for the service of the year 1744, at 9 per cent. interest, on having the term of their exclusive trade enlarged for fourteen years, and being permitted to borrow a million on bonds. This proposal being accepted, the debt from the public to the company became 4,200,000l., and the exclusive trade was now extended to three years notice, to be given by parliament after Lady-day 1780, with the former proviso, that, after such determination, the company should continue to have a common right with other subjects in the trade to India.

The company not subscribing to the reduction of interest proposed in 1749, the speaker of the house of commons was ordered to give them notice that the fund due from government would be paid off, unless they subscribed before May 30, 1750: with this it was deemed prudent to comply, but in consideration of the company having reduced their bond debt, they should be empowered to raise money by the sale of 5 per cent. annuities, to the amount of the debt of government to the company. The annuities thus sold were known by the title of 3 per cent. India annuities, and were for many years payable at the India house, but are now consolidated with the 3 per cent. reduced bank annuities.

Hitherto the company had not aspired beyond their original character of merchants, and merely possessed factories at the principal ports to which they traded; these factories were, for the safety of their merchandise and the protection of their freights, converted into forts, which rendered it necessary to maintain a military establishment. Thus possessed of the means of offence as well as defence, they made considerable exertions to oppose the progress of the French in those parts and as the two companies each endeavoured to procure the affiliation of the neighbouring native princes, the field of interest and ambition became much enlarged. In 1751, the company lent a considerable military force into the province of Arcot to support the nabob against his rival, who was powerfully assisted by the French; in which contention they were engaged with little intermission for several years. In Bengal, the company had carried on their commercial intercourse without any connexion with territorial authority, till the death of the nabob Ali-Verdi-Khan, in 176. This prince had viewed their increasing opulence and power with great jealousy, and a short time before his death gave a remarkable charge to his successor, in which he cautioned him to keep in view the power of the European nations in his country, and to free himself from their influence as soon as possible. "The power of the English is great; reduce them first; the others will then give you little trouble. Suffer them not to have forts or soldiers; if you do, the country is not yours." In attempting to put
this advice into execution, Son-Rajah-Dowla was completely defeated by the company's forces, and the new sultan of the appointment, besides paying to the company a very large sum for their loffs and expenses, ceded to them a considerable territory in the vicinity of Calcutta. On the coast of Commanded, hostilities were carried on against the French settlements with unequal success, but ultimately to the advantage of the English, upon which the sultan of the Deccan concluded a treaty with the company, and ceded to them the entire cree of Mysalipatam. In 1768, the company's forces completely defeated those of France, and in the following year captured Pondicherry, the chief of the French settlements in India; since which events the power of France in India has been very insignificant.

Such was the commencement of the company's acquisition of territory, which they have seized every subsequent opportunity of extending, till the sovereigns of India, whose protection they formerly courted, have sunk into the situation of their dependents, and hold their precarious dignities at the will and pleasure of a society of foreign traders.

The annual sales of the imports of the company for sixteen years preceding 1777, amounted on an average to about 2,055,000l.; and for the same period, the exported goods and stores amounted, at their prime cost, to 2,800,000l.; the bullion exported to 690,000l. per annum, and they paid in discharge of bills of exchange 192,000l. per annum.

Early in 1764, on the receipt of some unpleasant news from Bengal, India stock fell 14 per cent. The general administration of the company's affairs, both at home and abroad, became soon after the subject of much discussion; and on 29th August 1766, the court of directors received a notice from the secretaries of state, that an investigation would take place in the next session of parliament. The administration laid claim to the territories which the company had acquired in India, with the revenue arising from them, as of right belonging to the crown; but as the company were very unwilling to have this new source of wealth taken out of their hands, a temporary agreement was made for two years, by which the company, in consideration for this claim, agreed to pay to government 200,000l. a year. In 1769, the agreement was renewed for five years, and the territorial acquisitions and revenues in India leased to the company for that term, with a stipulation that the company should be allowed to increase their dividend to 12½ per cent. But not to increase it to more than one per cent. in one year.

They now became involved in a war with the famous Hyder Ali, in consequence of which, and of the misfortune of their servants in India, the concerns of the company, from the most flourishing situation, were brought into the greatest embarrassments. Select and secret committees of the house of commons were appointed to investigate the state of their affairs; and in 1773, it appeared, not only that they were unable to make the stipulated annual payment to government, but that it was necessary to withdraw a loan of 1,450,000l. Till this sum should be repaid, the dividend to their proprietors was not to exceed 6 per cent, and afterward not to exceed 7 per cent. till their bond debt was reduced to 1,500,000l. From these circumstances, the price of the company's stock fell considerably from the latter part of 1772 till February 1774, when their affairs began to wear a brighter aspect. In 1776, the loan from government had been repaid, and their situation being otherwise improved, the dividend on their stock was raised to 8 per cent.

**Statement of the Company's Revenues, at their different Settlements in India, in the year ending April 1777.**

<table>
<thead>
<tr>
<th>Item</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>To expenses in Bengal, civil, military, and fortifications</td>
<td>£1,350,000</td>
</tr>
<tr>
<td>To ditto at Fort St. George</td>
<td>£60,000</td>
</tr>
<tr>
<td>To ditto at Bombay</td>
<td>£65,000</td>
</tr>
<tr>
<td><strong>Nett balance of the year's revenues</strong></td>
<td>£2,790,000</td>
</tr>
<tr>
<td>By nett revenues in Bengal</td>
<td>£2,500,000</td>
</tr>
<tr>
<td>Benares tribute</td>
<td>£60,000</td>
</tr>
<tr>
<td>Oude subsidy</td>
<td>£37,000</td>
</tr>
<tr>
<td>By revenues of Fort St. George and the Circars</td>
<td>£40,000</td>
</tr>
<tr>
<td>Tanjore subsidy</td>
<td>£163,000</td>
</tr>
<tr>
<td>By revenues of Bombay, &amp;c.</td>
<td>£160,000</td>
</tr>
</tbody>
</table>

On an average of ten years, ending with 1777, the company's exports in goods were about 400,000l. in bullion, 110,000l. and the sum paid in discharge of bills of exchange, 400,000l. per annum. By the aid afforded from the revenue, their impositions were increased, so as to produce about 3,200,000l. per annum.

In 1779, an act was passed for continuing the territories and revenue in India in the possession of the company for one year, which in 1780 was continued for another year. In June 1780, it was agreed to offer to pay to the exchange 400,000l. in full discharge of all claims of the public upon the company up to the 1st of March; and as, in the preceding year, they had received notice that the 4,200,000l. due to them from government would be paid off on the 1st of April, 1783, it became necessary to enter into a new agreement, the conditions of which were, that the company should continue to enjoy their exclusive privileges to the 1st of March, 1794, then to cease and determine, upon the former conditions of three years previous notice, and the repayment of all sums due to them. The surplus of their nett profits, after paying their dividends, were appropriated, three fourths for the service of government, and one fourth to be retained by the company; and they were restricted not to increase the dividend of 8 per cent. more than 1 per cent. in any year. This restriction was, however, soon found unnecessary; for the nett profits of the company for the year ending 31st March, 1782, did not amount to so much as a dividend of 8 per cent. on their stock by 22,023l.; in consequence of which, it became necessary for government to allow a further time for the payment of 296,400l. 21. 6d., which was due from the company for customs, besides a part of the sum which they had agreed to pay in 1781; and they were at the same time empowered, notwithstanding the above deficiency, to continue their dividends at 8 per cent. In the following year, the war in India, and other circumstances, increased the embarrassment of the company's affairs; and, by a statement of their accounts to the 1st of March, 1783, it appeared that the
the nett profits of that year did not amount to a dividend of 8 per cent. by 255,813l., which dividend they were nevertheless authorized by parliament to continue; and, to enable them to do, government issued exchequer bills to the amount of 300,000l., which the bank undertook to lend money upon to the company.

The long and expensive war in which the company had been engaged in India, terminated in March 1784, by the ratification of peace with the Mysorean government; but the conseqence of this war, in addition to the war in Europe, was the general derangement of the company's affairs both at home and abroad. In December 1783, February and May 1784, the directors laid before parliament such accounts as they then possessed, respecting the general state of their finances. But the impossibility of drawing any satisfactory information from statements made up in such a situation of their affairs, with the apprehensions which the measures then in agitation, relative to the future government of India, had excited in the public mind, reduced the credit of the company to the lowest ebb. Their Stock fell as low as 11s. 3d.; their bonds at home, bearing 5 per cent. interest, were negotiated from 2½ to 4 per cent. discount; their bonds and certificates, at Bengal and Madras, bore from 18 to 40 per cent. discount; at Bombay 50 per cent.; and orders on the treasury there sold at 5s., and upwards, per cent. discount.

It now became a general conviction, that the company was incompetent to the political government of the extensive territories which they had acquired. A Board of Control was therefore established, composed of a certain number of commissioners to be appointed by the king, and removable at his pleasure. This board was authorized to check, superintend, and control, the civil and military government and revenues of the company. The dispatches transmitted by the directors to the different préficiencies were to be previously subjected to the inspection of the Board. The appointment of governor-general, president, or councilor in the different préficiencies, was made subject to the approbation and recall of his majesty; and such other regulations adopted, as in a great measure deprived the company of that political and civil authority which they had suffered to be so grossly abused.

In 1786 some further regulations were made respecting the government of India; and, as the company's trade was increasing, particularly in the article of tea, their import of which had been greatly augmented by a rearrangement of the commutation act, they were said to require a greater capital, and were authorized to create 800,000l. new stock, on which they raised 1,240,000l. at the rate of 15½ per cent. In 1789 they obtained another act, enabling them to add 1,000,000l. to their capital, which thus became 5,000,000l.

In the beginning of 1793, the term of the company's exclusive privileges being nearly expired, the subject of laying open the trade to India was again discussed, and though it was not thought proper to risk the loss and confusion which must unavoidably attend any attempt to take such an immense concern out of the hands in which it has so long continued, a bill was made in the agreement for the renewal of the charter, that such regulations should be adopted as to admit of a free exportation by private persons on their own account, of any goods of the growth, produce, or manufacture of Great Britain or Ireland; and of a free importation of such sorts of the raw materials of the East Indies as are used in the manufacturies of Great Britain or Ireland; that the company should be obliged to provide shipping for the carriage of the private trade, at as low a freight as it could be furnished by private merchants; and that they should license a proper number of agents to reside at the company's settlements, under their protection, for the management of the private trade. On these conditions the company's term in the exclusive trade was enlarged for 20 years, or to the 1st of March, 1814, with the former provision, that if, after the expiration of the term, their right to the sole trade shall cease, in consequence of three previous notice being given by parliament, and the repayment of such sums as may be then due from the public, they shall continue a corporation, with power to carry on a free trade in common with other persons.

On this occasion, the total income of the company, arising both from their territorial revenues and their commercial concerns, was stated as follows:

The nett annual income in rents and profits of trade, taken in the most unfavourable light to the company, and supposed to be considerably under the mark, was rated at £2,329,164.

Subject to the following payments, viz.

Interest of 3,000,000l. on bonds, at 4 per cent. £1,550,000.
Interest of 6,660,000l. debt in India, at various rates of interest, on a medium about 9½ per cent. £561,876.
Dividend of 8 per cent. on their capital of £5,000,000l. £400,000.

Leaving a nett annual surplus of £1,239,241.

Of this surplus it was proposed to appropriate 550,000l. per ann. to the reduction of the debt in India, to pay 500,000l. per annum to government in half-yearly payments, and to pay an increased dividend of 10 per cent. to their proprietors on 6,000,000l. to which sum their capital was now raised.

This annual surplus, if it really existed at the time to which the above account refers, was of very short duration. In 1795 the company found themselves unable to continue the proposed contribution to government; and the intrigues of Tippoo Sah with the French, and with some of the native powers, which obliged the company to keep up a large military establishment, and soon after to engage in another expensive war, not only reduced the surplus of their revenues, but occasioned a considerable increase of debt in India, which has since been further augmented in consequence of hostilities with Dowlat Rao Scindia and Jefwunt Rao Holkar.

In order to furnish some idea of the extent of the company's commercial and financial concerns, the following accounts are subjoined.

The amount of all goods sold at the East India Company's fairs, from the 1st of March 1785 to the 1st of March 1806.

<table>
<thead>
<tr>
<th>Company's goods, viz.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teas</td>
</tr>
<tr>
<td>Bengal piece goods</td>
</tr>
<tr>
<td>Coalt and Surat piece goods</td>
</tr>
<tr>
<td>Raw and organzine silk</td>
</tr>
<tr>
<td>Nankeens</td>
</tr>
<tr>
<td>Vynper</td>
</tr>
<tr>
<td>Salpetre</td>
</tr>
<tr>
<td>Spices</td>
</tr>
<tr>
<td>Drugs, sugar, coffee, &amp;c.</td>
</tr>
</tbody>
</table>

C 2      5,699,252

Private.
C O M P A N Y.

Private Trade goods, viz.

<table>
<thead>
<tr>
<th>Description</th>
<th>Quantity</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teas</td>
<td></td>
<td>£230,215</td>
</tr>
<tr>
<td>Piece goods</td>
<td></td>
<td>774,517</td>
</tr>
<tr>
<td>Rum casks</td>
<td></td>
<td>44,828</td>
</tr>
<tr>
<td>Nankensa</td>
<td></td>
<td>21,489</td>
</tr>
<tr>
<td>Pepper</td>
<td></td>
<td>16,633</td>
</tr>
<tr>
<td>Saltpetre</td>
<td></td>
<td>1,144</td>
</tr>
<tr>
<td>Drugs, sugar, indigo, &amp;c.</td>
<td></td>
<td>1,693,926</td>
</tr>
</tbody>
</table>

Total: £2,782,152

An Estimate of the revenues and charges in India for the year 1806-7.

Revenues:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengal</td>
<td>£9,148,711</td>
</tr>
<tr>
<td>Madras</td>
<td>5,621,325</td>
</tr>
<tr>
<td>Bombay</td>
<td>671,263</td>
</tr>
</tbody>
</table>

Total: £14,841,299

Charges:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bengal civil and military expenses</td>
<td>£6,944,467</td>
</tr>
<tr>
<td>Madras</td>
<td>5,137,921</td>
</tr>
<tr>
<td>Bombay</td>
<td>1,826,516</td>
</tr>
<tr>
<td>Commercial charges not added to invoices</td>
<td>192,769</td>
</tr>
<tr>
<td>Interest on debts</td>
<td>2,735,350</td>
</tr>
<tr>
<td>Supplies to Prince of Wales' Island, &amp;c.</td>
<td>185,000</td>
</tr>
</tbody>
</table>

Total: £16,840,100

Deficiency: £1,956,711

Account of the actual receipts and payments of the East India Company, in Great Britain, for one year, ending the 1st of March 1807.

Receipts:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cash in the Treasury 1st March 1806</td>
<td>£69,541,674</td>
</tr>
<tr>
<td>For company's goods sold</td>
<td>5,348,184</td>
</tr>
<tr>
<td>Of the board of ordinance for saltpetre</td>
<td>16,000</td>
</tr>
<tr>
<td>Private trade goods sold</td>
<td>2,114,269</td>
</tr>
<tr>
<td>Charges and profit on private trade</td>
<td>103,463</td>
</tr>
<tr>
<td>Customs on do.</td>
<td>7,178,263</td>
</tr>
<tr>
<td>Freight on do.</td>
<td>119,084</td>
</tr>
<tr>
<td>Interest on red. 3 per cent. annuities</td>
<td>3,556,150</td>
</tr>
<tr>
<td>Of government, on account of a sum due to the company</td>
<td>1,000,000</td>
</tr>
<tr>
<td>Alms-houses at Poplar</td>
<td>2,416</td>
</tr>
<tr>
<td>Perfoins returned from India</td>
<td>17,516</td>
</tr>
<tr>
<td>Bonds issued</td>
<td>517,000</td>
</tr>
<tr>
<td>Duty on tea received</td>
<td>3,120,506</td>
</tr>
</tbody>
</table>

Total: £15,288,527

Payments:

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customs</td>
<td>161,756</td>
</tr>
<tr>
<td>Freight and demage</td>
<td>1,689,040</td>
</tr>
<tr>
<td>Goods and stores exported</td>
<td>3,479,533</td>
</tr>
<tr>
<td>India debt</td>
<td>49,223</td>
</tr>
<tr>
<td>Bills of exchange from India</td>
<td>332,885</td>
</tr>
<tr>
<td>Ditto from China</td>
<td>64,999</td>
</tr>
<tr>
<td>Bullion exported</td>
<td>514,432</td>
</tr>
<tr>
<td>Charges of merchandise, including supra cargoes, commission, interest on loans, &amp;c.</td>
<td>623,652</td>
</tr>
</tbody>
</table>

Total: £15,288,527

Dividends on stock and interest on bonds: £77,312,191

Bonds paid off and paid in on foles: £216,600

Proprietors of private trade: £2,169,921

Pay to marine and military officers on furlough, and retired from service: £141,319

Duty on tea paid: £3,184,417

Cash in the treasury 1st March 1807: £511,078

The va$t concerns of this company are under the management of twenty-four directors, who are formed into different committees; each committee having the superintendence of a particular department of the company's business. At the general courts of proprietors, persons pofting 1000l. Rock have one vote; 3000l. two votes; 6000l. three votes; and 10,000l. four votes. The number of proprietors entitled to vote, on the 8th of April 1800, was 12193, and the number of votes 3812.

COMPANY, Hamburgh, is the oldest trading establishment in the kingdom; though not always known by that name, no ascribed to those narrow bounds under which it was afterwards confined. It was first called the Company of Merchants trading to Cassis, Holland, Zealand, Brabant, and Flanders; then it acquired the general title of Merchant-adventurers of England; as being composed of all the English merchants who traded to the Low Countries, the Baltic, and the German ocean. Lastly, it was called the Company of Merchant-adventurers of England trading to Hamburgh.

This company was not a society of dealers, each furishing a part of the sum to constitute the capital flock of the company; but a mere association, or body of merchants, who had nothing in common, but the grant and privilege of trading to Hamburgh, and some other cities of Germany; each managing his own commerce, and trading on his own foundation; only observing a certain discipline, and some regulations, which none but the company could establish or change.

This company was first incorporated by Ed. I. in 1296; and established again, by charter, in 1462, under the reign of Henry IV. It was afterwards confirmed and augmented with divers privileges, by many of his successors; among the rest, by Henry V. in 1413; Henry VI. in 1422; Henry VII. in 1493, 1505, and 1506; Henry VIII. in 1509, 1517, and 1526; Edward VI. in 1547; Queen Mary, in 1553; Elizabeth, in 1564, and 1566; James I. in 1607; and Charles II. in 1661. But of all these charters, none but those of Henry IV. Henry VII. Elizabeth, James, and Charles, were of any importance, or gave the company any thing new; the rest being only confirmations. Before the charter of Henry IV. all the English merchants, who trafficked out of the realm, were left to their own discretion, and managed their affairs with foreigners as might be most for their respective interests; without any regard to the general commerce of the nation.

Henry observing this disorder, endeavoured to remedy it, by uniting all the merchants in his dominions into one body; wherein, without losing the liberty of trading each for himself, they might be governed by a company; and be subject to regulations, which should secure the general interest of the national commerce, without prejudice to the interest of particulars. With this view, he granted all the merchants, of his states, particularly those of Calais, then in his hands, a power of associating themselves into a body politic, with directors...
dircctors and governors, both in England and abroad; to hold assemblies both for the direction of business and the deciding of controversies among merchants; make laws, punish delinquents; and impose moderate duties and taxes on merchandizes and merchants to be employed in the service of the corporation.

These few articles of the charter of Henry IV. were afterwards much augmented by Henry VII. who first gave them the title of Merchant-adventurers to Calais, Holland, &c. gave them a power of proclaiming and continuing free fairs at Calais; and ordered, that to be reputed a member of the society, each person should pay twenty marks sterling; and that the several members should attend the general meetings, or courts, appointed by the directors, whether at London, Calais; or elsewhere.

The inexecution of this last article and contempt of some of the rest, occasioning great inconveniences to the company's affairs, another charter was procured, whereby the pain of imprisonment was menaced, for those who should absent themselves from the meetings without lawful cause, or should disobey the laws. A petition being made to queen Elizabeth, in 1564, for an explanation of certain articles in the charter of Henry VII. and a confirmation of the rest granted by other kings; that princes, by a charter of the same year, declares, that to end all disputes, they should be incorporated anew under the title of "Company of Merchant-adventurers of England," that all who are members of the former company should, if they desire it, be admitted members of this; that they should have a common seal; that they should admit into their society what other persons, and on what terms, they please; and expel them again on misbehaviour; that the city of Hamburg, and neighbouring cities, should be reputed within their grant, together with those of the Low Countries, &c. in that of the former company; that no member should marry out of the kingdom, nor purchase lands, &c. in any city beyond sea; and that those who do, shall be 15% faith excluded for ever.

Twenty two years after this first charter, queen Elizabeth granted them a second; confirming the former, and further granting them a privilege of exclusion, with a power of erecting in each city within their grant, a flandering council.

The woollen manufacture being the principal object of their application, they met with great opposition; first, from the Hanse, who forced them frequently to change their mart, or staple; and afterwards under king James I. who having erected a corporation in 1616, in favour of some private persons, who offered to set up a manufacture for dyeing and preying cloths, &c. under pretence thereof the company of merchant-adventurers were prohibited dealing therein. But that project not succeeding, and the charter being revoked two years afterwards, the merchant adventurers, whose company had been dissolved two years before, were restored in 1617, to their ancient privileges, and a new charter was given them, confirming their exclusive rights; and allowing them to have officers in the several custom-houses, to have an eye that they were not prejudiced in their woolsens, under pretence of the like merchandizes, which others were allowed to fend to other parts. This charter of king James, is the last of those confirmed by Charles II. in the grand charter of 1661.

The revolutions which had happened in the Low Countries towards the end of the sixteenth century, and which laid the foundation of the republic of Holland, having hindered the company from continuing their commerce with their ancient freedom; it was obliged to turn it almost wholly to the side of Hamburch, and the cities on the German ocean; from which change some people took occasion to change its name to that of the Hamburch company, though the ancient title of Merchant-adventurers is still retained in all their writings.

This society was greatly reduced, when its trade was left open by William III. and the company is now extinct.

Company of Merchants of the Staple was incorporated by Edward III. Their factory was at Middleburgh, in Zealand; but the staple being removed, in 1390, to Calais, it was soon after, viz. in 1392, removed from thence to England.

Company, Ruffia. This was first projected towards the end of the reign of king Edward VI. executed in the first and second years of Philip and Mary; but had not its perfection, till its charter was confirmed by act of parliament, under queen Elizabeth, in 1566. It had its rise from certain adventurers, who were sent in three vessels on the discovery of new countries; and to find out a north-east passage to China; these, falling into the White sea, and making up to the port of Archangel, were exceedingly well received by the Muscovites; and at their return, solicited letters patent to secure to themselves the commerce of Ruffia, for which they had formed an association.

The charter was promised them by Edward VI. but he dying, was first dispatched by queen Mary, in 1555. By this charter, the association was declared a body politic, under the name of the "Company of Merchant-adventurers of England, for the discovery of lands, territories, islands, &c. unknown or unexplored." Their privileges were to have a governor, four consuls, and twenty-four afflictions, for their commerce; for their policy, to make laws, inflict penalties, send out ships to make discoveries, take possession of them in the king's name, set up the banner royal of England, plant them; and lastly, the exclusive privilege of trading to Archangel, and other ports of Muscovy, not yet frequented by the English.

This charter, not being sufficiently guarded, was confirmed by parliament in the eighth year of queen Elizabeth; whereby it was enabled, that in regard the former name was too long, they should now be called "Company of English Merchants for discovering new trades," under which name, they should be capable of acquiring and holding all kinds of lands, manors, rents, &c. not exceeding a hundred marks per annum, and not held of her majesty; in no part of the continent, island, harbour, &c. not known nor frequented before the first enterprize of the merchants of their company, situate to the north, or north-west, or north-east of London; or any part of the countries, islands, &c. under the obedience of the emperor of Ruffia, or in the countries of Armenia, Media, Hyrcania, Persia, or the Calpian sea, should be visited by any subjects of England, to exercise any commerce without the consent of the said company, on pain of confiscation. The said company shall use no ships in her new commerce, but those of the nation; nor transport any cloths, ferges, or other woollen stuffs, till they have been dyed and privileged. That in the case the company discontinue of itself to unload commodities in the road of the abbey of St. Nicholas, in Ruffia, or some other part, on the north coasts of Ruffia, for the space of three years, the other subjects of England shall be allowed to traffic to Narva, while the said company discontinues its commerce into Ruffia, only using English vessels.

This company suffered with reputation almost a whole century, till the time of the civil wars. It is said, the ear then reigning hearing of the murder of king Charles I. ordered all the English in his states to be expelled; which the Dutch taking the advantage of, settled in their room After,
After the restoration, the remains of the company re-established part of their commerce at Archangel, but never with the same success as before; the Russians being now well accustomed to the Dutch merchants, and mercurialize.

This company fulfills its end on the coast of that of Hamburgh, and the northern and Turkey companies; i.e., each member thereof traffic for himself, and on his own foundation; only paying an acknowledgement as fine for admission, which was reduced by 20 and 11 W. III. c. 6, to five pounds besides some other dues imposed, from time to time, for the occasions of the company, and the commerce in general. It is under the direction of a governor, four counsellors, and a treasurer.

Company England is established on similar ground with that of Hamburgh; from whence it appears to have been dismembered.

Its charter is dated in the year 1679. By the first article the company is erected into a body politic, under the title of the "Company of Merchants of the East," to confit of Englishmen, all real merchants, who have executed the business thereof, and trafficked through the Sound, before the year 1668, into Norway, Sweden, Poland, Livonia, Prussia, Pomerania, &c., all also Reiel, Koningberg, Danzig, Copenhagen, &c., excepting Narva, Mutcovy, and its dependencies. Most of the following articles grant them the usual prerogatives, of such companies; as a seal, governor, courts, laws, &c.

The privileges peculiar to this company are, that none shall be a partner of a member who is already a member of any other company; nor any retail dealer at all. That no merchant qualified, be admitted without paying 6l. 13s. 6d. By 29 C. II. c. 7, the fee of admission into this company was reduced to 2l. That a member of another company, deferring to renounce the privileges thereof, and to be received into that of the East, shall be admitted gratis; provided he procures the same favour for a merchant of the East, willing to fill his place. That the merchant adventurers who never dealt in the East, in the places express'd in the charters, may be received as members of the company on paying forty marks; that, notwithstanding this union of the adventurers of England with the company of the East, each shall retain its rights and privileges. That they shall export no cloths but what are dyed and pressed, except a hundred pieces per annum, which are allowed them gratis.

This charter was confirmed by Charles I. in 1629, with this addition; that no person of what quality, ever, living in London, should be admitted a member, unless he were free of the city.

This company was complained of as a monopoly, and first curtailed by legal authority in 1672; and since the declination of right in 1693, exiles only in name; but they still continued to elect their annual officers, who are a governor, deputy, and twenty-four assistants.

Company, Turkey, or Levant. This once flourishing body had its rise under queen Elizabeth, who, in 1580, incorporated a small number of merchants, with the privilege of an exclusive trade to Turkey for seven years. James I. in 1605, confirmed their charter, with the addition of some new privileges. During the civil wars some innovations were made in the government of the company; many persons having been admitted members, not qualified according to the charter, or who did not conform to the regulations prescribed, in consequence of which Charles II., upon his restoration, endeavoured to place it upon its ancient basis, for which purpose he gave them a new charter, containing a confirmation of the old one with some additional articles. By this charter the company was declared to be a body politic, capable of making laws, &c., under the title of "The Company of Merchants of England trading to the Seas of the Levant." The number of members was not limited, but no person residing within twenty miles of London, excepting noblemen and gentlemen of quality, was to be admitted into the company, unless first made free of the city of London; those under 26 years of age were to pay 23l. for their admission, and those above that age 53l. These fines were reduced by an act passed in 1753, (26 G. 11. c. 18) by which it is directed that every subject of Great Britain deferring admission into the Turkey company, shall be admitted within thirty days after such request, and shall enjoy all the liberties and privileges of the company, on paying for such admission the sum of 20l.

All persons free of the company may, separately or jointly, export any goods or merchandise (not prohibited) from any place in Great Britain, to any place within the limits of the company's charter, in British or plantation built ships, navigated according to law, at any time, and to any persons whoaver, being free of the company, or to the sons or apprentices of freemen; long as they shall remain under, and submit to, the direction of the British ambassador and consuls for the time being; and may also import, in like manner, any commodities purchased within the company's limits, on payment of the government duties; and such importations shall be subject to all merchandise exported orimported, or upon ships laden thereafter, with, for defraying the necessary expenses of the company.

The company is under the management of a governor, a deputy governor, and fifteen directors; they have also a deputy governor in every city and port where there are any members of the company. They present the ambassador which the king is to keep at the Porte, and elect two consuls for Smyrna and Constaninople; allowing a fixed salary or pension to the ambassador and consuls, and even to their chief officers, as secretary, chaplains, interpreters, and janitors, that they may not have any pretence for raising any sum whatever on the merchants or merchandise. For defraying these charges the company have power to levy duties on the merchandize imported or exported by their members; but of late years they have frequently found it necessary to apply to parliament for pecuniary assistance.

The commerce of this company was formerly very considerable, having been estimated nearly equal to that of the East India company in extent, and much more advantageous to Great Britain; but the convenient situation of the French ports in the Mediterranean for the Levant trade, gives that country such a decided advantage, that the commerce of Great Britain with Turkey has long been on the decline. In 1797, in order to avoid the hazard to which British vessels in the Levant trade were exposed in consequence of the war, an act was passed giving permission to the members of the Turkey company to import the goods usually brought from Turkey, Egypt, or other parts of the Turkish dominions in the Levant seas, from any port whatsoever, either in British vessels or vessels belonging to any friendly nation, on paying, if in British vessels, the same duties which would have been payable if the goods had been imported directly from the place of their growth, and, if in foreign vessels, the duties to which they were subject liable; but no entry of such goods was to be made at the custom house till the importer produced a certificate of his being a member of the Turkey company, and that he had paid the company's duties, and in all respects conformed to the company's regulations.

Company,
COMPANY.

Company, South Sea, originated in a project for relieving the government from the embarrassment of a large amount of unfunded debts, and considerable deficiencies in the funds appropriated for the payment of others; the proprietors of these debts being incorporated for the obvious purpose of establishing a trade to the south seas and the N.W. coast of America. The capital of the company was £177,677 l. 154. 4.; but this being subscribed wholly in government securities, they issued bonds in 1712, for raising 200,000 l. in cash in order to fit out their first mercantile adventure. In the following year, they obtained the Affiento contract, by which they agreed to import into the Spanish West Indies 144,000 negroes, within the term of 30 years. At the rate of 4000 in each year, and were allowed to send a ship of 500 tons yearly to trade with the Spanish settlements, on condition that the king of Spain should have a fourth part of the gain by each ship, and receive five per cent. on the nett gain of the other three parts. See Assiento.

The first voyage of their annual ship was in 1717, and the company were again empowered to borrow money under their common seal, for carrying on their trade, or to enable them to fulfill an engagement with government to advance two millions towards carrying into execution a proposed reduction of interest on the public debts. On the war breaking out in the following year, a fleet was put to their trade with the Spanish West Indies, by the seizure of their effects, by which they sustained a very considerable loss.

Soon after this interruption of their commercial concerns, they engaged in a scheme for converting some of the government terminable annuities into redeemable debts. They had, in 1715, for the accommodation of government, agreed to increase their capital to 10,000,000 l., which, by the annuities now purchased, and an advance to government, became £11,746,844. 8 s. 10. 4.; and although the scheme did not completely succeed, it prepared the way for the more extensive project of taking in all the public debts, and thus reducing all the public funds which then existed into one.

The mere rumour of this mercantile project raised the price of the company's flock to 126 per cent.; and, in the beginning of 1720, while the bill for carrying it into execution was depending in parliament, their flock got up from 117 to 319 per cent. As the transaction consisted merely in taking the public debts at a fixed price, and giving the proprietors, in exchange, a certain quantity of the company's capital flock, at prices agreed upon between the company and the subscribers, it is evident that the great gain which the company expected to make, could arise only from the current price of their flock being considerably above its real value. By a variety of artifices, and a general flock jobbing infatuation, it was carried up to the enormous price of 1000 per cent.; the rapidity of its fall, however, exceeded that by which it rose, as it was in a few weeks down to 130 per cent.; involving in ruin pensions of all descriptions who were engaged in the wild speculations of the time. Had the transaction completely succeeded, the capital of the company would have amounted to £43,411,399. 6 l. 113. 4.; but from some of the debts remaining unsubscribed, it became £27,802,483. 14. 2.; of which four millions were purchased in 1722 by the bank, and in the following year the remainder was divided into two equal parts, one of which was to be called the trading capital of the company, and the other to be distinguished by the title of "The joint-flock of South Sea annuities," since called old South Sea annuities.

In 1724, the company undertook the Greenland white

filhers, which turned out very unprofitable; after eight voyages, they sold their ships, stores, and utencils, and found that their whole loss upon this huf mains, capital and interest included, amounted to £237,142 l. 61. 2. d.

In 1733, three fourths of their trading capital, which had been reduced by fines paid off in 1727, 1729, and 1732, to £1,451,203 l. 8 s. 1. d.; was converted into an annuity flock called "New South Sea Annuities," only one fourth remaining as their trading flock; and, in the following year, they petitioned the king to be allowed to dispose of the trade and tonnage of their annual ship under the Affiento contract, on account of the little profit they made by it, and to accept of such equivalent as they could obtain from the king of Spain, who, at length, put an end to the many disputes which had arisen from this contract, agreed in 1750, to pay 100,000 l. to the company, as a compensation for their being unable to get a legal charter under the Affiento contract, and from that period they have not carried on any trade whatever. The whole benefts of the company, therefore, now consists in the management of the following public funds:

<table>
<thead>
<tr>
<th>Funds</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Their capital flock</td>
<td>£3,662,784</td>
</tr>
<tr>
<td>Old South Sea annuities</td>
<td>£11,074,720</td>
</tr>
<tr>
<td>New South Sea annuities</td>
<td>£8,491,830</td>
</tr>
<tr>
<td>Three per cents.</td>
<td>£1,919,600</td>
</tr>
</tbody>
</table>

The interest received from government on all these funds, is 3 per cent., but the dividend paid to the proprietors of the company's flock, is 3% per cent.; on the old and new annuities, 3% per cent.

The company is under the management of three governors, and 21 directors; the qualification required for a governor, is the possession of 5000 l. in the company's flock; for sub-governor, 4000 l. : for deputy-governor, 3000 l. ; and for a director, 2000 l. Five hundred pounds flock, gives a right to one vote at the general courts; 1000 l. to two votes; 3000 l. to three votes; 5000 l. to four votes.

Company, Scotch Darien. This was established with good prospect at Edinburgh, in 1697; for the commerce of South America. In 1698, they sent an armament and a colony, which they endeavoured to establish in the illums of Darien, which parts North and South America; but the English ministry not thinking proper to avow and support the first successes of the company, which had alarmed Spain, ever jealous of this part of her territories, the Scotch colony was dispossessed by the Spaniards in 1699, and thus vanquished the belt project that ever was formed for disputing with that nation the possession of those countries, from which she pretends to exclude all other nations.

Company, Hudson's Bay, was incorporated by charter, dated the 2d of May, 1670, under the title of "The Governor and Company of Adventurers of England, trading into Hudson's Bay," with the exclusive privilege of trading to all parts within the entrance of the freight commonly called Hudson's freights. The charter, however, not being confirmed by act of parliament, the company possesse all exclusive rights. However, any British subject being at liberty to fall into Hudson's Bay, to fish or traffic with the Indians as freely as the company; all the advantage the company have over other adventurers thither is merely the benefit of their own forts, such as they are, by which their agents can reside in so inhosipitable a country during the winter, preparatory to their trading with the Indians against the arrival of their ships in the summer. According to the evidence given before a committee of the house of commons in 1749, the company then possessed four small factories, erected at the mouths of the principal rivers, in which they employed about 130 per-
COMPANY.

The capital of the company, it is said, does not exceed £10,000, which is divided among a very small number of proprietors. The commerce carried on by them is not of great extent, but seldom employs above four or five ships of about 500 tons each. The articles exported by them are coarse druffe cloth or blanketings, guns, pistols, sword blades, hatchets, powder and shot, spirits, tobacco, bras kettle, button, fish hooks, looking glasses, &c.; the imports consist of large quantities of Beaver skins, and peltry of all kinds, bed feathers, quills, calafornia, whalefin, oil, and a few smaller articles.

The company is under the management of a governor, deputy governor, and a committee of seven members.

The company, Sierra Leone, was set on foot in the year 1791, with the philanthropic view of introducing civilization into Africa. The principal means proposed for effecting this end was the establishment of a secure factory for carrying on an extensive commercial intercourse with the interior; but before the arrangements for this purpose were completed, the reception into the settlement of near 100 blacks, who had taken part with Great Britain in the American war, and had petitioned the government to be removed from Nova Scotia on account of the coldness of the climate, involved the company in considerable difficulties, and gave it a new character to the undertaking. Their exposure, from various causes, became much greater than could have been foreseen, amounting in the first two years and a half to 111,500, and were still further increased in 1793 by the war, which at the same time greatly interrupted their trade, and subjected them to depredations. In October 1794, the colony was attacked by a French squadron, and all the moveable property of the company was either carried off or destroyed, every building belonging to them burnt, and several ships captured. The company's losses on this occasion have been estimated at £5,000. This calamity, combined with their previous expenses, so greatly diminished the company's funds, as to lay them under a necessity of contracting their trade, and reducing considerably the scale of their establishment, which had been at all times so limited as scarcely to afford sufficient means of transacting the business and attending to the various wants of an infant settlement.

In the year 1798 the colony had made considerable progress, notwithstanding the many obstacles to its advancement. The town consisted of about three hundred houses, with the necessary public buildings, and had become a place of considerable respect. It was estimated that from one to two hundred natives visited the settlement every day, many of them coming from a distance of eighty or a hundred miles, for the purpose of exchanging articles of African produce, for British manufactures. The total number of inhabitants of the colony at this time was about 1200.

In 1800 the company obtained a charter, creating their settlement an independent colony, and authorizing the directors to frame laws for its government, to appoint a governor and council, and to make other arrangements for the administration of justice; a small military force was at the same time lent for the defence of the colony. The sum of £7000 being part of the sum granted by parliament for the maintenance of African forts, was paid to the company for the erection of a fort; £10,000 was about the same time received from government as a partial indemnification for the expense to which the company had been put in settling the Nova Scotians; £4000 was also granted for the support of the civil government of the colony. About this time the company agreed to receive in their colony the Maroon Indians, and soon after their arrival, employed them to quell an insurrection among the Nova Scotians, who had endeavoured to pollute themselves of the government. A more serious attack on the colony was afterward made by some of the native chiefs in the neighbourhood, which rendered it necessary to adopt additional means of defence.

The sums since granted by parliament for defaying the charges of the civil establishment of the company, and for the erection of fortifications, have been as follows:

For the year 1801 £ 4,400
1802 10,000
1803 14,000
1804 14,000
1805 14,000
1806 18,000

The trade of the company appears to have been successful, supposing it to have been hitherto only with those charges which are chiefly commercial, and to have been exempt from the extraordinary losses by fire, and the destruction of the settlement which it has had to sustain. The abolition of the slave trade will remove some great obstacles to the success of this laudable undertaking, and probably enable it to improve and extend its commercial intercourse with the natives very considerably.

COMPANY, for the Manufacture of Flour, Meal, and Bread. During the difficulties occasioned by the great scarcity of corn, in the year 1800, a number of persons formed themselves into a company, for the purpose of establishing in London a manufactury of flour, meal, and bread, to be sold out at reasonable prices. They were incorporated by parliament, and empowered to subscribe a joint capital, not exceeding 120,000l. in shares of 25l. each; their profits being limited to 10 per cent., and the surplus, if any, to be at the disposal of parliament. They were limited to sell only 120,000 sacks of flour, or meal in a year, to make only 200 sacks into bread in a week, and to sell not more than 1000 quarters of wheat in any one week. The managers of the company were prohibited from dealing in corn, flour, or bread, for their own private account; and were required to lay before parliament an annual statement of their receipts and payments, of the quantities of grain purchased, with the prices paid for the same, of the quantities of grain and flour in store, of the quantities of flour and bread manufactured by the company, and of the debts and credits of the company, with the names of all the members of it, and the number of shares held by each. By these regulations sufficient publicity is given to the concerns of the company, to prevent it from ever being perverted from the original principle of the establishment, and made subservient to schemes of monopoly or speculation; and though upon the scarcity ceasing, they discontinued making bread, they have carried on the manufacture of flour and meal, and probably contributed to prevent their essential articles from being unnecessarily enhanced in price.
The total quantity of wheat purchased by the company in the year 1836, was 9,182 quarters, for which they paid £25.6.5d. 19s.; the quantity of flour manufactured was 15,757.55 bushels. The number of proprietors of the company was 370.

The king by an order in council may dissolve this company on six months previous notice being given.

Company, Dock. See Dock.

Company, Dutch East India, had its rise in the midst of the struggle that people had for their liberty; for the Spaniards having forbid all commerce with them, and shut up all their ports, necessity inspired some Zealanders to seek a new north-east passage to China.

This enterprise proving unsuccessful to three several armaments in 1594, 1595, and 1596, a second company was formed under the name of the "Company of remote Parts," which, in 1595, took the ordinary route of the Portuguese to the Indies, and returned in two years and a half's time, with little gain, but good hopes.

This company, and a new one just established at Amsterdam, being united, equipped other fleets; and these occasioned other companies at Amsterdam, Rotterdam, in Zealand, &c., infomuch that the flates soon began to apprehend they might be prejudicial to each other. Under this concern they called all the directors of the several companies together, who all confined to the union, the treaty whereof was confirmed by the flates in 1602, a very remarkable epocha, as being that of the most solid and celebrated establishment of commerce that ever was in the world.

At this time they obtained a charter from the flates; and prevailed upon that body, by administering to its exigencies in the Spanish war, to grant them the exclusive privilege of trading to the southern parts of Africa, for a short term of years. The company's capital of 6,500,000 florins (about 2,521,833 l. sterling) was divided into transferable shares, or acciones, as they are called on the continent, of 3000 florins (about 1764 l. sterling each), which were all speedily bought up. The superiority of their trading capital, together with their greater skill in commerce and navigation, enabled them to under sell all other nations, even in the foreign markets of Europe. As they also fixed the prices of their merchandise to all consumers, their profits for some years were enormous. The annual dividends for the 6 years ending in 1610 were as high as 36 per cent.; and in a short time, the actions rose from 3000 to 15,000, and at one time floated as high as 24,500 florins, 8 times the amount of their prime cost. The charter, first granted in 1602, and since renewed from time to time, conferred upon them, besides the exclusive right of trading to the East, the sovereignty (under the superintendence of the states-general) of all the territories which they might acquire in that part of the world, by parcells, tracts, or conquest, with the full power of appointing their own servants, of raising whatever force they might deem necessary for the defence of their territories; and of enacting laws for the internal administration of their dominions. In consequence of this charter, the most extensive that was ever granted to any trading corporation, the company proceeded to arrange their establishment, both in Europe and the East Indies. Their affairs were under the management of 56 directors, divided into several chambers; twenty in that of Amsterdam, twelve in that of Zealand, fourteen in that of Delft and Rotterdam, and a like number in those at Sluys and Hoorn. As each grant expired the company was obliged to procure a new one, which it has already done, four times since the

The first vis. one in 1623, for forty-one years, like the first; another for twenty-one years, commencing in 1645; and a third in 1665, for forty years; a fourth in advance, commencing in 1698, to end in 1740. Each grant cost the company a considerable sum; that of 1647 cost 1,600,000 guilder, and the two following ones more; that of 1698 was confirmed by a placard of the states general, granted them an exclusive privilege, which was prolonged in 1761, for thirty years more. The average premium paid for these renewals was about 270,000 l. sterling, or three millions of florins.

Their factories, refidences, &c. in the East Indies, were very numerous; reaching from the Persian gulf to the coast of China; the principal was that of Batavia, the centre of their commerce: here resided the general, with the flate and splendor of a sovereign prince; making war and peace with the eastern kings and emperors at pleasure. They had also several other considerable factories on the coast of China, in Japan, Malacca, Surat, Amboyna, Bandi, Sum, Moluccas, &c., several on the coast of Commandel, and on Ipanah, Cape of Good Hope, &c. in all, they numbered forty factories, and twenty-five fortresses. They engrossed the whole trade of the figery in their own hands.

At an early period as the year 1616, this company had no less than 45 large vessels engaged in war and trade, with 10,000 soldiers and sailors in their service, and 4,000 pieces of artillery. However, the florishing state of their affairs was of short duration. The mismanagement and plunder of the company's servants, and the disputes in which their cruelties, avarice, and imprudence involved them with the native powers during the 17th century, and the difficulties which arose among the different chambers of the general direction at home, greatly reduced the trade, wealth, and power of the institution. The expense of the military establishment also increas'd; so that at the end of the 18th century, it amounted to 80 vessels, carrying from 50 to 60 guns, and 25,000 men, soldiers included, while the whole dominions in Java, and its dependencies, were farmed for 301,263 dollars. The directors acknowledged that, in 1782, their losses in the war had exceeded 10 millions of florins, nearly twice the amount of their original capital. In the 18th century, the Dutch East India company excited the jealousy of the Dutch company. In 1721, a law was passed by the former, prohibiting their subjects from falling under the East India colors, upon pain of death; and in 1731, this unfortunate affair was dissolved in consequence of representations from the different European states interested in the East Indian trade; among which Holland, that is the Dutch company, took the lead. Various precautions have been used to support the credit of this company, some of which were oppressive to the country; nevertheless, its shares have continued to fall with augmented rapidity. In the period from 1605 to 1779, the dividends have varied from 75 to 10 per cent.; and in many years no dividend at all was given. From 1605 to 1610 (both inclusive), the dividend was, at an average, 56 per cent. From 1610 to 1613, the average was only 21; and from 1777 to 1780, it was no more than 12.4 per cent. The price of the actions, which had at first risen to 500, and even 800 per cent. of the prime coin, fell, in the period from 1770 to 1780, to about 340 per cent., and during that time continued regularly to fall. The last dividend this once flourishing company made to its proprietors was in the year 1798; but it was not paid till 1816, as their commerce, which had been rapidly declining for the last 30 years, was entirely suspended.

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The Company, Dutch West India, was established in 1621, with an exclusive privilege to trade twenty-four years along the coasts of Africa, between the tropic of Cancer and Cape of Good Hope; and in America, from the south point of Newfoundland, through the Straits of Magellan, that of Le Maire, or others, to the Straits of Anian, both in the north and south Sea.

Besides these commercial privileges, the shares conferred upon the corporation the right of governing and defending any new colonies which it might acquire; and made it a present of several large vessels, well manned. They retained to themselves, however, the nomination of the company's governor-general abroad. The original capital of this association amounted to 72,000 florins, in transferable shares, or actions, of 600 florins each.

The 74 directors were divided into five chambers (as in the East India company), out of which, eighteen, with a deputy appointed by the states, were chosen for the general direction of affairs. In 1647, the company renewed its grant for twenty-five years; but it was scarce able to hold out the term, on account of its great losses and expenses in taking the bay of Todes land, Staten, Feramboc, and the greatest part of Brasil, from the Portuguese. The weakness of the company, which had several times in vain attempted to be joined to that of the East Indies, occasioned its dissolution at the expiration of its grant.

In 1674, a new company, composed of the ancient proprietors and their creditors, was settled in the same rights and establishment with the former. It was to undertake the burden of the old company's debt, amounting to six millions, but reduced to 50 per cent.; and was to accredit in its books the proprietors of the old company's stock, at the rate of 15 per cent. The creditors, on their part, were to advance an addition of 8 per cent. on their loans; and the stockholders were to advance 4 per cent. on their shares. The new capital, thus scraped together, amounted only to 600,000 florins. The exclusive commerce of the company was limited to a certain part of the African coast, besides the commodities they should make; and its principal establishments were at Cape Verde, on the Gold Coast, at Togo, Curafalco, &c. in America. The roll of the trade amounted to the former company; and the former commerce was thrown open to all the subjects of the republic. In 1720, when the charter was renewed, the African slave-trade was made free, on condition of a certain tribute being paid to the company; and in 1724, the whole African trade was laid open upon the same terms. As the united privileges of the company were not sufficient to counterbalance the various disadvantages under which all fresh institutions labour, they obtained, in 1632, the exclusive management of the colony of Surinam, for the trilling sum of 200,000 florins paid to the states-general. This grant was accompanied by certain conditions, framed with the manifest view of preventing the abuses common to trading corporations. Under these restrictions, the company was not able to delay the essence of the original purchase-money paid for the charter; and, therefore, in the next year, one-third share was sold to the city of Amsterdam, and another to the rich family of Sommelsdyk, retaining the remaining third to themselves. These three co-proprietors have since continued to form a society or partnership, under the name of the "Surinam Company," regulated by the charter originally granted to the West India company. Except in the government of Surinam, this association has had no connection with the West India company, which, of course, continued to furnish negroes to the settlement, in its capacity of African company, until the year 1730.

The progress of the dividends and prices of West India stock will enable us to judge concerning the prosperity, not only of the Surinam society, but also of the concerns of the West India company. The average dividend in ten years, ending 1690, was 2½ per cent.; and from 1721 to 1779 inclusive, nothing at all was divided. The actions have never been at par; their price has varied from 92½ to 18 per cent. since the year 1733. The average price during ten years, ending 1732, was about 81½ per cent. During ten years, ending 1779, it had fallen to 32½ per cent. The settlements of Essequibo and Demercy have been always under the charter of the West India company, as well as Surinam, and governed in the same manner. Berbice, though within the company's charter, owed its origin to the speculations of the family of Van Peere; and all the cultivated part of the colony belonged to them. In 1687 they obtained a perpetual grant of it from the company, which was confirmed in 1703, and when the French attacked it in 1712, the colony bought them off with a considerable composition. The money was paid by their great mercantile houses, and one fourth of it by the Van Peeres, who thus transferred three-fourths shares of the colony to the other merchants as co-proprietors; and the four houses together formed a company or company at Berbice, administered exactly in the same manner with the Surinam society. The proprietary governments of North America differed from the company administrations of Guiana in many important particulars. They were the consequence of large and thoughtless grants, made by the court to favourites, of waste and uninhabited lands. As the British colonies were subservient to the legislature of the mother-country, the Dutch colonies owed the same allegiance, not to the states-general, but to the proprietors. The ill success of the West India company furnishes an useful example of the manifold evils of company government. This company must in great part be ascribed to the capture of all their settlements.

Company, Dutch North, has no exclusive privilege; the advantage of its patent being of another kind, and very considerable.

There are also, in Holland, companies for the Baltic sea, the fifty of New Zealand, Davis's Straights, and Greenland; yet none of their fisheries are interdicted to private traders; all the difference between the and the companies confining in this, that the former may not go a shore to cut their fish in pieces, and meet their lord: but must bring their cargo to Holand.

Company, Dutch Levant. In Grecia, there is no Levant company in Holand: but the commerce of the private traders is so considerable, that the state has taken the regulation thereof on itself.

To this end, they have established a chamber of direction at Amsterdam, composed of six deputies, and a regular who, under the burgomasters, take care of every thing relating to the commerce of the Mediterranean; especially that of Smyrna and Constantinople.

This company names the consuls, appoints the number and strength of convoys, terminates differences among the traders, and has also a right, on occasion, to add new regulations to the old ones; though these be of no force, till confirmed by the states general.

Company, French East India, was established in 1664, with an exclusive privilege to trade for fifty years in all the seas of the East Indies and South Sea; no adventurer to be admitted without a thousand livres in stock; and foreigners, who have twenty thousand livres in stock, to be reputed speculators.

The patent grants them the island of Madagascar; and the
the king to be at one fifth of the expense of the three first armaments, without interest; the principal to be refunded in ten years; or, if the company finds it loses on the whole, the loss to fall on the king's side.

The capital fund of the company, which was mostly furnished by the king, was ten or eight millions of lives, but was to have been fifteen millions.

In effect; though no means were wanting to support the company, yet it did drop off, and still shrunk; till, having subsisted ten years without any change in its form, and being no longer able to discharge its engagements, there were new regulations concerted, but to little purpose. At length, things not being disposed for a new East India company, nor much good to be expected from the old one, in 1708, the ministry allowed the directors to treat with the rich traders of St. Malo, and resign to them their privilege under certain conditions. In the hands of these last, the company began to flourish.

Its chief factory was at Pondicherry, on the coast of Coromandel; this was the residence of the director-general; the other factories were inconsiderable. The merchandizes which the company brought into France were, flax, cottons, spices, coffee, rice, salt-petre; several kinds of gums and drugs, wool, wax, printed calicoes, muslins, &c. The trade was laid open in 1769, which soon reduced the company to a sort of mere holders of the government funds. A new company was established in 1785, with the privilege of an extensive trade to all parts of the East Indies, except the island of France and its dependencies. This exception must have prevented the company from succeeding; but the experiment had scarcely been made when the trade was again laid open by the national assembly in 1790. As for the other French companies, such has been the fate of the country, they are all, we presume, extinct; and it is needless to give any account of them. Such were the French West India company, established in 1664, and possessing by their charter the property and sovereignty of Canada, Acadia, the Antilles island, the Isle of Cayenne, and the Terra Firma of America, from the river of the Amazon to the coast of Oroono; with an exclusive privilege for the commerce of these places, as also of Senegal, and the coasts of Guinea, for 40 years, on condition of paying half the duties; but in 1674 the grant was revoked, partly on account of the poverty of the company, and partly because it had an unfavourable effect on the commerce of the West Indies from the Dutch:—the French Missipipi company, first established in 1684, in favour of the eleveur de la Salle, who failed in search of the Missipipi, but mis-carried with his colony, and came to an untimely death. He was succeeded by M. Hibernelle, who found the Missipipi and settled a colony there; but this adventurer being poisoned, M. Crozat obtained in 1712 the sole privilege of trading to the French territories called Louisiana, granted to him for 15 years:—Company of the West, formed in 1717, when M. Crozat surrendered his grant before mentioned; and obtaining besides every thing granted to the former company the commerce of beaver, enjoyed by the Canada company from the year 1706, but expiring in 1717:—India company, formed by a junction of the former company with that of Canada and with that of Senegal in 1718, and also by an union with the East India company, and with those of China and St. Domingo, with the two first in 1719, and with the third in 1720:—the Biflot company, arising from the association of two merchants of Marille and in the 17th century for fishing of coral in the gulf of Stora-Courcoury on the coast of Barbary, on the frontiers of Algiers and Tunis: so called from a small port called the "Bantion of France," built in 1591, but it funk in 1633;— and several other companies, which either fell of themselves, or upon the expiration of their grants, and which it is therefore needless to mention.

Company, Danijb North, was established at Copenhagen in 1647. Its establishments are very considerable in Norway, Sweden which, it lends itself to Warangal, where they convey their merchandizes by land into the Danish Lapland; and by fedges drawn by rein-deer into the Munifico Lapland. It also lends others for Barandai and Siberia: where its agent takes them up, and conveys them, in like manner, on fedges, to Panigarod, the capital of this port of the Munifico empire.

The commodities it lends thither are rix-dollars, tobacco, and linens; it returns nothing but furs and skins.

Company, Danijb Iceland, established in the same year with the North Company, its chief factory is at Kirkebar, a large town in that island.

Company, Danijb East India, established in the year 1616, and involved not only with the exclusive privilege of trading to the East, but with the powers of civil and military administration; their chief factory was at Tranquebar. In 1634 this corporation was dissolved, and another, with similar privileges, substituted in its place. This also rapidly declined; and in 1686, a third institution was tried for the same purposes; but this too failed in about 23 years; and the project was tried for the fourth time in 1732. The new company was provided with ample privileges and powers; and the submission of these preferred its existence, and increased the profits of the flock holder, at the expense of the country, and of the Indian settlements. In 1772 the charter expired, and was renewed under restrictions which proved ruinous to the prosperity of the company. In 1777, the king purchased the rights of the company, and the private trade began to flourish. When the charter was renewed in 1792 for 20 years, the private trade was rendered still more free; all Danish subjects, and all foreigners were permitted to trade with the Indian settlements, upon receiving passports, either from Copenhagen or the Atlantic seaports of government, and upon condition of returning with the cargoes to Copenhagen.

Company, Levant. of the Genoves, established in 1664, and confirmed by the Pope; notwithstanding the opposition of the French. From 1670 this company has languished and sunk.

For a more particular account of the rise and progress of most of the above mentioned and other companies, see "Anderson's Hist. of Commerce."

Company, New River. This corporation consists of a governor, deputy governor, treasurer, and twenty-six directors, who hold a weekly board for appointing officers, granting leases, and redressing grievances. The projector of this canal for bringing water to London, with the assistance of king James I. and the corporation of London, is supposed to have expended 100,000l. upon it: the profits, which are divided into twenty-two shares, for the first thirty years admitted of little more than five pounds to each share; but their value is much increased, and its original shares of 100l. are now estimated at upwards of twelve thousand pounds each.

Company, in French compagnies. A certain number of people of war under the inspection and command of a chief called captain. The number, however, is never fixed, but varies. In the guards, as in the artillery, a company consists of 120 men. In the Artillerie service a company consists of 200 men. A compagnie d'ordonnance was originally composed of fourteen companies of gens d'armes of a hundred hommes. 

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cluded the company of infantry, and the word cavale the company of cavalry. A company seldom consists of fewer than 50 men. It generally has three or four ferrnants, three or four corporals, and two drums.

Company, Artillery. See Artillery.

Company of Musicians, in the city of Wellminster. See Charter.

Company, in Sea Language, denotes the whole crew of a ship, including her officers.

Company of Ships, is used for a fleet of merchant vessels, who make a kind of charter-party among themselves; whereby, under several clauses and conditions tending to their common safety, they engage not to quit one another, but to defend each other reciprocally, during their voyage.

These associates, in the Mediterranean, are called consorts. The chief conditions of the charter-party are, that such and such shall be owned admiral, vice admiral, and rear-admiral; and those that bear no guns, shall pay so much percent. of their cargo, for the expenses of the admiral; that such and such signals shall be observed; that if they be attacked, the damages shall be reimbursed by the company in general, &c.

Company, Rule of, or Fellowship, in Arithmetic, is a rule whereby we discover or ascertain the share of the profits, or duties, belonging to the several partners, or associates, in any enterprise, in proportion to the stock each contributed thereto, and the time that stock was in bank. See Fellowship.

COMPARATE, Comparada, in Logic, the terms or subjects of a comparatid; or the two things compared to each other.

COMPARATIONE—Punctum ex COMPARATIONE. See Punctum.

COMPARATIONIS, Homogeneum. See Homogeneum.

COMPARATIVE Anatomy. See Anatomy.

COMPARATIVE Degree, in Grammar, is an inflexion between positive and superlative degrees; whose effect is, to set a thing above or beneath the level of another.

The Latins expressed their comparative degree by a particular termination of their adjectives, and particles; wherein they are followed by the English, though by few others of the modern languages.

The French form most of their comparatives by adding the particles plus, moins, and aussi; the Italians, by più, meno, &c. as the thing is to be raised, lowered, or equaled to another.

COMPARE, Valdi, in Geography, an island in the Ionian sea, anciently called Ithaca, noted for having been the country and kingdom of Ulysses.

COMPARISON, the relation of two persons or things, considered as opposed, or set against each other, in order to find wherein they agree or differ; or wherein one has the advantage of the other.

COMPARISON of Ideas, an act of the mind, whereby it compares its ideas one with another, in respect of extent, degree, time, place, or any other circumstances. This operation of the mind is the ground of relations.

Brutes from not to have this faculty in any great degree; they have, probably, several ideas distinct enough; but cannot compare them rather than as to some fableable circumstances an exed to the objects themselves: the power of comparing general ideas, which we observe in men, they have not, as we may probably conjecture.

COMPARISON, in Rhetorics, is a figure, or rather place, in speech, whereby two things are considered with regard to some third, which is common to them both.

Thus, Cicero, "Catoni licuit extundi bellum civile, igitur et Ciceroni hec est." "It was allowed Cato to engage in the civil war, therefore it may be allowed Cicero," where, to engage in the civil wars is common to both.

There are three kinds of comparison; the first a majus, i.e. from the major to the minor, as that of Cicero against Antony, "Quid feci? domi tua, cum alii teneat, quae, in soto?" Or that of Terence, "Quis erat, si parentem non fuisse?" From the same place, Ovid endeavours to appem Cæsar.

"Cur ergo esse negant leniri Caesarivrat
Cum videam mitis holibustus effe Deos?"

The second, à minore, i.e. from the minor to the major; thus Cicero, "Majoris nihil esse mercatoribus, ae navigatortibus injuriosus et fastidiosus, habet constitutum, vos tot civium Romanorum millibus uno nuntio atque uno tempore necatis, quos tandem animo effe debitis?"

The third à pari; as when we contend, that what obtains in one thing, ought to obtain in another of the same kind: "It was a law that he who killed his father should be hanged up in a sack, and thrown into a river; therefore, he who killed his mother deserts the same punishment."


COMPARTMENT, or COMPARTMENT, a design composed of several different figures, disposed with symmetry, to adorn a parterre, a cycling, panel of joinery, or the like.

The term of compartment is also used in painting. The Turkish and Moorish paintings are only compartments; the fine bindings of books are in compartments, &c.

COMPARTITION, in Architectura, the useful and graceful distribution of the whole ground plot of an edifice, into rooms of office, and of reception, or entertainment. Compartment makes one of the great divisions of the art of building.

COMPARTMENTS, in Gardening, are beds, plats, borders, and walks, laid out according to the form of the ground, and depend more on a good fancy, than on any set of rules, for their construction. They are also sometimes merely diversities or knots of flower-gardens or parterres, of which there is an infinite variety, according to the fancy of the designer. Plain compartments are pieces of ground divided into equal squares and flower beds, marked out by lines, and made of regularly equal length and breadth. Some allow to these squares borders of two feet broad, if the plot of ground be small, and if larger of three feet, and edge the borders with box, or with upright hardy thyme; the alleys up between are to be laid with sand or gravel, and kept clean weedless.

COMPARTMENT of tiles, is an arrangement of white and red tiles varnished, for the decoration of the covering of a roof.

COMPARTMENT, alley of. See Alley.

COMPARTMENT, in Heraldry, is the term for a partition in coat armour, when the arms of several families are borne by one, either on account of intermarriages or otherwise.

COMPASS, the Mariner's or Nautical. A period of about 500 years is now elapsed, since an admirable property of a natural production was either discovered by, or intro-
COMPASS.

duc'd amongst the nations of Europe. To the simple application of this remarkable property, mankind is indebted principally for the discovery of a new continent nearly equal to the old one, for an extensive commerce between the most distant nations, and for an accurate knowledge of the shape and size of the world we inhabit. The magnet is the natural production, and its directive property forms the active part of that wonderful guide, the mariner's compass, or as it is more commonly called, simply the compass; probably from its moving in a circle, or from its compelling the whole horizon. Whatever relates to the history, the construction, the use, and the defects, of this singular machine, is rendered extremely important by the curiosity, the interress, the security, and the wants of the human species.

The time when the attractive property of the magnet was first discovered, is by no means known. The opinions are various, but they are not established upon historical documents of sufficient accuracy and authenticity. Certain however it is, that mankind was acquainted with it at a very early period. Father Kircher, in his work, De Magnetis, l.t. cap. v., endeavours to prove that the Hebrews were acquainted with the magnet's singular property of attracting iron; and from Plutarch it appears, that the Egyptians were not ignorant of it. Pythagoras, Eolomy, Hippocrates, Empedocles, Democritus, Leucippus, Epicurus, and several other ancient philosophers, knew and admired this wonderful property of the magnet. Thales and Anaxagorae were so struck with it, as to imagine that the magnet had a soul; and Plato said that the cause of its attraction was divine. Aristotle, Theophrastus, Dioscorides, Galen, and others, were likewise acquainted with this property of the magnet. But its directive property (viz. that property by which, if placed upon a piece of cork, or wood, &c. to swim on the surface of water, or if it be suspended by a very flexible thread, so as to have sufficient freedom of motion, it will constantly place itself in a certain situation with respect to the cardinal points of the world) does not appear to have been known to the ancients; and though the time of the discovery of this property is of a much more recent date, yet this too is involved in much doubt and obscurity. It seems, however, that the use of this property, or (what amounts to the same thing) the use of the magnetic needle, was not known in Europe before the thirteenth century. The honour of its discovery has been much contested. The Spanish Jefuit Pineda, and Kircher, affirm that Solomon knew the use of the compass, and that his subjects actually used it in their navigations. Plantus in Mercator, aet v. scene ii., has the following remarkable passage, Hoc secundus venus eft, cape modo werforiam. Now some authors are of opinion, that by the word werforiam or werforiam, is meant the mariner's compass; but some learned critics affirm that werforiam or werforiam, meant a particular rope. And Dr. Lorimer is inclined to believe that it only meant the helm.

By the consent of most writers, it seems that a certain Flavio, or Johns, de Gioja, or Giova, or Gira, a Neapolitan, who lived in the 13th century, has the bell title to the discovery. Flavius Blond affirms that about the year 1302, the above-mentioned John de Gioja, a noble citizen of Amalphi, a town of Principato, in the kingdom of Naples, first discovered the mariner's compass; and he quotes the following verse from Antony of Palermo, recorded by the Neapolitan historians, viz.

Primo dedit nautis usum magnetis Amalphi.

The arms of the territory of Principato have, it appears, ever since been a mariner's compass. See Collins, et From belleu de aevii magnetica inventore. Infl. Acad. Bonon. tom. ii. p. 3, p. 372.

Dr. Gilbert, an English writer of the 16th century, in his book De Magnetis, affirms that Paulus Venetus (the Venetian Marco Paulo) brought the invention of the compass to Italy in the year 1260, having learned it of the Chinese. But this cannot be true; for Marco Paulo did not set out for the first time before the year 1269, and did he return before the year 1295 (see Purchas's Pilgrim, vol. iii.); whereas the directive property of the magnet, and the communication of that property to felce, was known in Europe before that time; though in all probability it was not used in navigation till some time after, which may very reasonably be attributed to the clumsy mode of suspending the magnetic needle's, which must at first have been practised. Ludii Veromannus affirms, that when he was in the East Indies, about the year 1350, he saw a pilot direct his course by a magnetic needle, fastened and formed like those now in use. And Mr. Barlow, in his Navigator's Supply, anno 1597, relates, that in a personal conference with two East Indians, they affirmed that, instead of our compass, they used a magnetic needle of about six inches in length, suspended upon a pin in a dish of white China earth filled with water, in the bottom of which were marked two cross lines to indicate the principal winds; the roll of the divisions being left to the skill of their pilots. But these two last observations, being of a date much posterior to the use of the magnetic needle in Europe, conclude nothing with respect to its original discovery; since the use of that magnetic property might have been introduced into Asia by some European.

P. Duhalde, in his General History of China, vol. i. in the annals of the Chinese monarchy, speaking of the emperor Hongti, when he gave battle to Tchi T'ou, says, "He perceiving that thick fogs favored the enemy from his puruit, and that the soldiers rambled out of the way, and loft the course of the wind, made a carr, which showed them the four cardinal points. By this method he overtook Tchi T'ou, made him prisoner, and put him to death. Some say there were engraven in this carr, on a plate, the characters of a rat and a horse, and underneath was placed a needle to determine the four parts of the world. This would amount to the use of the compass, or something very near it, being of great antiquity and well attested." And in another part of the same book, speaking of certain ambassadors, he says, "After they had their audience of leave in order to return to their own country, Tchiou Kung gave them an instrument, which on one side pointed towards the north, and on the opposite side towards the south, to direct them better on their way home, than they had been directed in coming to China. This instrument was called Tchi Nan, which is the same name as the Chinese now call the sna-compas by: this has given occasion to think that Tchiou Kung was the inventor of the compass." This happened in the 22d cycle, above 1040 before Christ. Renautod adds strong reasons against the knowledge of the mariner's compass amongst the ancient people of China, and of Arabia. See Kircher, De Magnetis, lib. i. cap. v.

In the works of Claude Fauchet, entitled, Renseil de l'origine de la Langue et Pays Francs, fol. 555, there is a quotation from an old French poem, called le Biblie Guiet, in which the mariner's compass is evidently mentioned. This same passage is likewise quoted by Muichenbrock, in his Differtatio de Magnete. The passage in which the compass is mentioned forms part of the abovementioned poem, contained in a curious quarto manuscript of the 13th century, on vellum, belonging to the royal library at Paris, which was never published. The poem entitled la Biblie Guiet,
Cuius, forms the first article of the volume; the author of
which, viz. Cuius de Provincis, as mentioned in the poem it-
self, was at the court of the emperor Frederic Barbarossa,
held at Mentz in the year 1281, when the emperor’s two
sons were knighted. See Chron. Abbot. Ufperg. p. 311.
Here follows this remarkable passage in its antiquated
language, to which is subjoined a literal translation made by
a native of Provence.

Extrae from la Bibil Cuius.
Iecile efoie ne fe muet,
Une arts font qui mentir ne puet,
Par la virtu de la manete
Une piee laide et brune,
On il fers volantz fe joint.
Ont regardent lor droit point.
Puez eune agileu dont touchye,
Et en un felto dont fillie,
En longue la mette tens plus,
Et il faitu la tient desus;
Puis fe torne la pointe toute
Contre leoftoie faire douce;
Quunt il nus ent tenche et brune
Con ne soit efoie ne lune,
Lor font a laguille alunier
Puiz ne puent ils asserer,
Contre leoftoie vers le pointe;
Par ce font il mariner conto,
De la droite voie tenir;
C’est uns ars qui ne puett mentir.

Literal Translation of the preceding.

This same (the pole) star does not move, (and)
They (the mariners) have an art which cannot deceive,
By the virtue of the magnet
An ugly brownish star
To which iron adheres of its own accord.
Then they look for the right point,
And when they have touched a needle (on it)
And fixed it on a bit of straw
Lengthwise in the middle, without more,
And the straw keeps it above;
Then the point turns just
Against the star undoubtedly,
When the night is dark and gloomy,
That you can see neither star nor moon,
Then they bring a light to the needle;
Can they not then allure themselves
Of the station of the star towards the point (of the
needle?)
By this the mariner is enabled
To keep the proper course;
This an art which cannot deceive.

Francis Cabeus, a Jesuit of Ferrara, says, that the first
thing he knew professedly written respecting the directive
property of the magnet, was an epistle of Petrur Peregrinus
Gallus, about the latter end of the 13th century. A few
years after, this epistle was digested by one John Tainier,
who published it in his own name, under the title of Opus-
culum perpetua memoria dignifimum de natura et effectibus
magnetis. Some years ago, Mr. Senebeer of Geneva sent
the following memorandum concerning this letter to Dr.
Lorimer in London.

"Epifola Petri Peregrini de Marcour,
Ad Sigierum de Fomancourt, Militem.
de Magnete."

"The work contains a description of that star, the
means of finding the poles, its property of attracting iron,
and proves that the part of the magnet which is turned
towards the north, attracts that which is turned to the south.
It then teaches the manner of employing the magnet in
navigation, and of playing tricks thole of Compas. It des
erves to be remarked, that the author knew not that
the magnet could be employed in navigation; for though he
frequently speaks de fella nautica, he never speaks of the
star, which might be made of the magnetic needle in sea
Catalogue of the manuscripts in the library of Geneva, by Se-
nebeer. p. 272."

Among the manuscripts of the university of Leyden,
there is a volume containing several scientific tracts, one
of which is a Latin letter of Peter Adiger, on the properties
of the magnet. It is, in fact, a little methodical tracts,
divided into two parts, the first of which is subdivided into
ten, and the second into three chapters. This letter, which
seems intended for the instruction of some particular friend,
is dated in the year 1260. A few years ago, Mr. Cavallo
obtained an exact copy of this curious letter, of which he
inferred very ample extracts, both in the original Latin
and in English, in the supplement to the second and third
editions of his treatise on magnetism, from which it appears
that the writer, at that early time, was acquainted with all
the principal properties of the magnet. The following is
the translation of the most remarkable part of the above-
mentioned letter, which describes the compass, and men-
tions the declination of the magnetic needle.

"Part II. Chap. 2. On the construction of a better in-
strument to answer the same purpose, viz. to find out the Az-
imuth of the Sun, the Moon, or any Star upon the Horizon.

"In the present chapter, you will be informed of the
construction of another instrument of more certain effect.
A vessel must be made of wood, copper, or any other ma-
terial, and let it be turned like a box of small depth, and
competently wide. Let a cover of some transparent sub-
te, as glass or crystal, be adapted to it; and if the whole
be made of some transparent matter, it would be still better.
A slender axis of copper or silver must be adapted to the middle of this vessel, applying its extremities
to the upper and lower parts of the box, viz. to the cover
and to the box; the axis, however, must not be so firmly
fastened, as not to be capable of moving very freely.
Two holes must be perforated in the middle of the axis, at right
angles to each other, and an iron style, like a needle, must
pass through one of these holes, while another style of sil-
ver or copper passes through the other hole in a direction
crossing the iron one. The cover must first be divided into
dark four parts, and each of these into ninety parts, agreeably
to the instructions given concerning the other instrument
in the preceding chapter, and upon it mark the north and the
south, the east and the west, points; and let a ruler of some
transparent substance, with lights on its extremities, be
adapted to it. Then place whichever part of the magnet
you please, viz. the north or the south, near the glass, un-
til the needle be moved towards the Said magnet, and ac-
quires the virtue from it; after which, the magnet being
removed, the extremity of the needle will turn itself towards
the pole. This being done, turn the box until one extre-
mity of the needle remains directed towards the north part
of the instrument, or the north part of the heaven; then
turn the ruler towards the sun in the day time, and towards
the stars in the night time, after the manner mentioned in
the preceding chapter. By means of this instrument, you
may direct your course towards cities, and islands, and all
other
Compass.

Other parts of the world, either on land or at sea, provided you are acquainted with the longitudes and latitudes of those places; for, if the town or island to which I intend to go is in a lower latitude than the place in which I am, I shall go straight before me, towards that end of the ruler which is directed to the sun or star; but if the latitude of the place be greater, I shall proceed in the opposite way, viz. in the direction of the other extremity of the ruler. Observe, that the south part of the needle, which is to be used as a guide, must be made to decline towards the west by one point; and this must be done by the declination of the north part towards the call, because the south part of the instrument is definite of divisions.

"Take notice that the magnet, as well as the needle that has been touched by it, does not point exactly to the poles, but that part of it which is reckoned to point to the south, declines a little to the west; and that part which looks towards the north, inclines as much to the east. The exact quantity of this declination I have found, after numerous experiments, to be five degrees. However, this declination is no obstacle to our guidance, because: we make the needle itself decline from the true south by nearly one point and a half towards the west."

To this letter, Mr. Cavallo, in his treatise, subjoins the following observation. "It appears that the suspension of the needle in the above description, is a very clumsy one; and that the beautiful suspension by a cap upon a pin, which is now universally used, was unknown to the author. It is likely, therefore, that for want of this suspension, the needles at that time not moving sufficiently, were not actually used in navigation, at least in Europe, though the suspension by means of a cap upon a pin, seems not to have remained long unknown after the date of this letter."

Sir G. Wheeler says, that he had seen a book of astronomy older than the year 1522, which mentions the use of the needle in astronomy, but not in navigation.

Caffè d'Ascase, as an argument of the French having been the inventors of the mariner's compass, that the north point of it is always marked with a flower-de-luce. Lib. x. Diag. Lat. t. 1. p. 139. As for Gorgopius's pretence, that the compas must have been invented by the Danes, Dutch, or Germans, because the 32 points on it are written and pronounced in the Dutch, or Teutonic language, it is hardly deserving of a reply. Dr. Wallis attributes it to the English, for no other reason, but for its being called compass. Vincentius Belloncinius, and Albertus Magnus, who lived about the year 1245, allo Lavinius Lemnianus, make mention of the direction of the poles of the magnet, as from a tract de Lapidibus, which had been attributed to Aristotle; but is, with more probability, supposed to have been written by some Arabic author, not long before their own time. This tract has been since lost.

Notwithstanding the foregoing remarks, it is still very doubtful whether the use of the compass in navigation, or even the directive property of the magnet, was known by any people before the Europeans, or about the 15th century; and it appears, that in the same century, or soon after, the above-mentioned Neapolitan, Flavio, or John de Giaja, if not the original discoverer, was at least the first who used the mariner's compass, or constructed it for the use of vessels in the Mediterranean.

The principle of the construction of the compass is extremely simple. A magnet, or a piece of steel that has been rendered magnetic by means of natural or artificial magnets, must be freely suspended, so as to be able to move without obstruction; for such magnet or piece of steel will, in that case, direct itself to certain parts of the world, which will of course indicate to the observer the direction of any other place, provided its situation on the surface of the earth be known. Suppose, for instance, that you are at sea near Portsmouth, and wish to go towards Newfoundland, which lies to the west. By looking at the magnetic piece of steel or magnet, one extremity of which looks nearly towards the north, and turning your face to that part of the world, you proceed towards your left hand, at right angles to the direction of the needle; for in that direction Newfoundland is to be found. And after the same manner, you may proceed in any other direction. Such is the simplicity of the principle; but the practical application of it, especially in the present accurate mode of constructing instruments, and of making observations, requires a great degree of mechanical nicety, and a considerable degree of attention to a variety of circumstances, upon which the accuracy of the instrument, and its various applications, absolutely depend.

On account of those particulars, and in consequence of various contrivances made at different times, the compass or magnetic needle has undergone innumerable alterations, both in shape and size; and every kind of construction is attended with peculiar advantages, as well as defects; the most essential of which we shall endeavour to point out in the following species. See 1. The land compass, which is used either for the pocket, or is adapted to the odolites, to celestial and terrestrial globes, &c.; 2. The steering compass for the use of vessels at sea. 3. The animal compass, which serves to find the sun's or star's azimuth, whence the actual or true direction of the magnetic needle may be ascertained (this seldom being due north and south); and 4. The variation compass, which, being situated in a proper place on land, shows the daily variation of the magnetic needle from its ordinary direction. See Magnetic Declination, and Magnetic Variation.

A common seaviging needle rendered magnetic, and simply laid upon water, or fastened to a cork, or draw, &c., and so laid upon water, in a glass, or earthen or wooden cup; or else suspended by a very flexible thread, which must be fastened to its middle, forms a simple but imperfect compass; and such, in a 1 probability, was one of the first modes of constructing the compass, whence the magnetized steel, wire, or bar, has, ever since, been called the magnetic needle. The defects of the last-mentioned construction are too evident to need any particular remarks. The needle laid upon water is continually running to the side of the cup, the water is liable to be split, or if a thread be used, the likeness of it will always influence the action of the needle. To avoid these inconveniences, an excellent contrivance was substituted. It is a conical cavity made in the middle of the iron or steel bar, as shown in Plate, Magnetical, fig. 1. the open of which rests upon a pointed wire a, which enables the needle to move with the greatest freedom imaginable. The open of this cavity should come as near as possible to the upper surface of the needle, or rather a little above it, as in fig. 2. in which case the upper surface of the middle part of the needle is left a little more elevated than the rest. But in order to avoid any irregularity in the shape of the needle, as well as any difficulty in the mechanical formation, the needles are mostly pierced quite through, with a pretty large hole; a piece of hammerd brass is riveted into this hole, so that the open of it may stand even with, or very little above, the upper surface of the needle. The upper part of the wire upon which the needle rests, is generally made of hard steel, whilst
whilst the lower part is made of brass. This construction answers very well for a considerable length of time; yet, by continual rubbing, a small proliferation or irregularity of the cavity, is at length produced, which will in some degree obstruct the free motion of the needle; hence, in the bevel needles, the upper part of the above-mentioned cavity is formed in a piece of agate, which is not in the brass piece, as shown in fig. 3., where AB is the needle, d, of the brass piece riveted in a hole in the middle of it, and B is the piece of agate. These needles that constructed are said to have an agate cap. The defect to which those agate caps are subject, is, that on account of the hardness of the stone, the cavity in it seldom runs to a point; the consequence of which is, that the pin which supports the needle is apt to shift from one part of the agate cap to another, and of course the centre of the needle cannot always coincide with the point of suspension.

The forms of the needles have likewise been very numerous. Some are flatter and longer, others broad and short; several needles of the common fort are made broad towards the end, but tapering towards the middle, or they terminate in two very sharp points. Sometimes that extremity of the needle, which points towards the north, is formed like a crescent; but the most objectionable of all, are those which consist of two wires, and may be frequently met with on board merchant ships. Two pieces of steel wire, each bent in the middle so as to form an obtuse angle, and when fixed under the cards in the centre of which the brass cap is fastened, form a longitude. All those shapes may, in great measure, answer for common purposes; but they differ from being accurate or regular in their performance, the reason of which is, that a piece of steel of irregular form generally has more than two magnetic poles; almost every corner or protuberance being a south or north magnetic pole; in consequence of which the axis of the needle never coincides with its magnetic axis, the latter of which changes its situation in proportion as some of the above-mentioned poles become stronger or weaker than the rest; and this is continually the case.

In order to avoid every irregularity of shape, and even the perforation, needles, for certain purposes, have been suspended in the following manner: AB (fig. 4.) is the magnetic needle of a parallelopipedical form, which is fastened to a piece of brass C D. In the middle of this piece of brass at g, there is a small conical cavity, wherein an agate cap is set. In order to suspend this needle, a bar FH (fig. 5.) of brass, or copper, or wood, is made fast to a box KL; in the middle of this is a short point wire is fixed, which, when the bar is made to pass through the brass piece C D of fig. 4. viz. through g, cuts the agate cap, and supports the needle. Fig. 5. represents the whole together, where F H is the bar fastened to the box, A B is the brass piece, seen lengthways, or in the direction of the needle, which passes through the hole A B, and moves below the bar F H. It is evident that in this construction the needle cannot turn quite round, consequently this form of suspension is not useful for navigation.

The Chinese method of suspending the magnetic needle is exceedingly ingenious (see fig. 6 and 7.), the first of which represents a section of this suspension as viewed in the direction of the needle, and the second exhibits a lateral view of the same. The letters refer to the same parts in both figures. I is a brass cap very thin and light, and towards the edge of it there are two holes, opposite to each other. B D is a very slender blade of brass, the upper part of which A, is shaped like a ring, through which the needle C D passes. The extremities of this blade of brass go through the holes in the lower part of the cap, and are fastened to it by being turned over its edge. The magnetic needle C D consists of a cylindrical steel wire about an inch long, and not above a fortieth part of an inch in diameter; having its northern extremity only painted red by way of distinct. All this is supported by the pin E, which is fastened to the bottom of the box, and upon which it moves very freely. In this construction the needle is above the point of suspension, yet the centre of gravity of all the three pieces (viz. cap, needle, and of brass) taken together, is below the point of suspension, which prevents the cap, &c. falling off from the pin when the compass is fixed in an horizontal position; but to prevent the cap with the needle being shook off by any sudden jar, or by inverting the instrument, there is a very thin brass plate fixed to the box, a fiction of which is indicated by FG. It has a hole through the middle, which, being smaller than the diameter of the aperture of the brass cap, prevents its falling off. It appears, from a variety of experiments, that the perforation through the magnetic needle is not attended with any bad consequences. The external shape of the needle requires to be formed with greater attention, this being more apt to produce a multiplicity of poles. A very broad needle seldom has its magnetic axis coinciding with the axis of its figure. A very flatter and long needle almost always has more than two magnetic poles. There is a certain breadth, proportionate to the length of a needle, which is left sufficient to an irregular dispersion of the magnetic virtue; this proportion, however, cannot be accurately determined. The little swelling generally left about the middle of the magnetic needle in order to give them strength, where the perforation for the cap would otherwise weaken them, has not been found to produce multiplicity of poles, provided it be made smooth and free from corners. The lengths of the needles commonly used at sea are from three to six inches, but those that are ned or variation needles are generally made longer, though they need not, however, exceed eight or at most nine inches. With respect to the fulness of the needle, it must be observed that certain kinds of steel are more apt to acquire the magnetic virtue than others; but this must be determined by actual trial. The common forts of magnetic needles are brought down to what is called by the workmen a blue temper, because in that state they are easily magnetized; but it must be observed that if in that state they are easily magnetized, they are at the same time liable to lose that power very easily; therefore the magnetic needles, if they are made too hard for that cause, when once rendered magnetic, which is easily done, they will retain that power almost for ever after. The magnetic needles, though perfectly balanced before they are magnetized, will, after that operation, incline one of their extremities towards the horizon, which is in consequence of the dipping property of the magnet. See MAGNETISM, and DIPPING NEEDLE. Therefore after the communication of the magnetism, it becomes necessary to balance the needle again; but this must not be done either by grinding off part of that extremity of the needle, or by adding a fixed weight to the opposite extremity of it, because the quantity of that dipping varies according to the change of situation on the surface of the earth. The best way of adding this weight is by placing a small piece of brass on one arm of the needle, capable of being slid nearer to, or farther from, the centre of the needle, by which means the balance of the needle when left may be easily restored. Upon all these considerations, a needle of the best form and size is exhibited at fig. 8. and 9., the former of which represents a vertical, and the latter a lateral, view of it. A D
The needle of hard steel, $C$ is the agate cap let in a piece of bone, $D$ a mark made on that extremity which points towards the north, in order to distinguish it from the other, and $E$ is the piece of bone which may be fixed upon the arm $C D$, for the purpose of balancing the needle.

The frames and sizes of the compasses used upon land are very numerous: some being of the usual size of a watch-ceil, and they are actually fixed in such cases; others are of the size, and externally in the form of a pocket watch; others again are made in a wooden box, square on the outside, but circular within; some are of a larger size, in a brass box. Sometimes a little funnel is affixed to some compass boxes, and so forth. But though the shape be different, the principle of the construction is the same in them all. The box, whether of wood, or brass, or silver, or other substance, must have no particle of iron or steel in its construction; and even the brass, when that metallic substance is used, must be tried by pressing the extremity of a very delicate magnetic needle to every part of it; for if any attraction be observed, that brass must be rejected, otherwise the needle would not move with sufficient freedom. Brass is frequently magnetic, especially after being hammered, which is generally done by the workmen, for the purpose of rendering it hard. A pin of hard steel is fixed in the centre of the box, upon the point of which the needle rests; and a glass plate covers the cavity. This glass plate rests upon a shoulder, and there is very little above the piece $C$ (fig. 9), so as not to touch that piece, whilst at the same time it prevents the needle's falling from over the pin. In several of the compasses a little piece of wire with a button is affixed to the box, which is formed so as to stop the motion of the needle when the compass is not intended to be in action, as when it is carried in the pocket, &c.

The friction which must naturally take place in cleaning the glass cover of a compass, frequently excites its electricity, in which case the needle is attracted more or less by the glass, and its free motion is thereby partly or entirely obstructed, Phil. Trans. N.S., 480, p. 243. This inconvenience may be removed by pulling a wet finger in various directions over the surface of the glass. Few needles of land compasses are furnished with cards like those which are used at sea. In general the principal points of the horizon are marked in the bottom of the box, and a divided circle is added to the box, so that the edge of it may be even with, and so near as almost to touch, the extremities of the needle.

The compasses used at sea for ascertaining and directing the course of vessels, differ from the former principally by their having a circular card, whose diameter is equal to the length of the needle, fixed upon the needle, so as to turn with it, and by the box being let in a mechanism on four cross centres, called gimbalts, the office of which is to keep the compass box always in a horizontal position, whilst the external box moves with the ship, as the latter rolls and pitches. This construction will be easily understood, by observing fig. 10, which exhibits a feeing compass as viewed by an eye placed perpendicularly over it. A B C D is the external wooden box, which is fastened to and moves with the ship. E F is a brass circle having two pivots or axes, G H, which turn in two holes in the opposite sides of the wooden box; i.e., in the compass box, which is likewise furnished with two pivots or axes. $r, u$, and these turn in two holes made in the brass ring $E F$. Now as the direction of these last pivots, $r, u$, is at right angles to the direction of the pivots, G H, it will be easily understood, that in whatever direction the vessel, and the box $A B C D$, which is fixed to it, may incline, the compass box, i.e., represents always in an horizontal position, for it will turn either upon the pivots, $r, u$, or upon the pivots, G H. K is the card which is fixed to the magnetic needle and moves with it, under the glass cover, through which it may be distinctly seen. The outer edge of this card is divided into 360 degrees, and within the circle of those divisions it is again divided into 32 equal parts or arches, called the points of the compasses, or rhumbs. These rhumbs are usually divided into quarters. Their names, beginning from the north point, and going all round, are as follows: the letters standing $N$, for north; $E$, for east; $S$, for south; and $W$, for well.

The construction which has been more generally used in the royal navy, is an improvement of the above. Dr. Knight, a gentleman of very extensive knowledge in magnetism, in this construction the weight of needle, card, &c. is removed considerably below the point of suspension or centre of motion, by the addition of a brass circle, whose diameter is equal to that of the card, which is made very thin. This ring being fixed below the card, and the needle above it, the centre of gravity of the whole comes low enough to admit of the cap being situated below the needle; hence the needle needs not be perforated. This needle is a perfect parallelepiped. The figs. 11 and 12 represent the lower and upper parts of this (Dr. Knight's) card, needle, &c. about one half of the real size. A B is the needle, and $C$ represents the outer part of its cap, situated below it. The under part of the cap is seen at $G$; $A D B$ is the card. The brass edge, or circle, is represented by $F E O$, and is fastened to the extremities of the needle, (the card being interposed) by means of two screws. $H, I$, are two sliding weights to balance the card.

A few years ago another sort of construction was contrived by Mr. K. McCulloch, for which he obtained a patent. The figs. 13 and 14 represent this compass, the former being a fection, and the latter a perspective view of it. In this compass, both the compass-box and the needle, with the card, are suspended upon points, the extremities of which come very near to each other; which construction keeps them horizontal without any gimbals, as will be easily manifest by the following description. Fig. 13, $A a a a$, is the common wooden box, with its lid; $b b$ the brass compass box; $c c$ the glass cover to it; $d d$ the hollow conical bottom; $e e$ the prop, upon which the compass is supported instead of gimbals; the spherical top of which is finely polished, and the apex of the hollow cone is fitted to receive it; $f f$ is a quantity of lead run round the bottom and cone of the compass box, to balance and to keep it steadily horizontal; $g g$ is the card, and the magnetic needle, bent in such a manner as to bring the point of the conical pivot, on which it moves and is supported, very near to the centre of gravity, as well as to the centre of motion; $h h$ are two guards, which, by means of the two pins $i i$, affixed to the compass-box, prevent its turning round, and deceiving the freightman. In fig. 14, both the lid and $E e$ the
the front of the box are removed; \( b \), \( b \) are the guards; \( b \) the compass-box, and \( e \) is the prop which supports the box.

The greatest inconvenience that attends the use of the compass at sea is the irregularity of motion induced by shocks of sudden impulsion. In those cases the needle is suddenly moved out of its direction, and the card of the compass takes a vibrating for a considerable time, during which the observations are not correct. Methods have been tried for the purpose of removing this inconvenience, and the above-described compacts of Mr. M'Culloch's convenience was supposed to accomplish this end in a considerable degree; but the experience of some years shows that this is not the case. The least suffered by them suffer too powerfully magnetized, because, they say, then the needles are not steady. The fact is, that when the needle is not strongly magnetic, it follows the irregularities of the ship's motion in a great degree; which renders it apparently more steady; but the very same cause which enables it to follow the irregular motion of the ship, prevents at the same time its placing itself in the magnetic meridian. With the same degree of inappropriateness, some persons have endeavored to prevent the irregular shocks or vibrations of the magnetic needle by increasing the friction between the cap of the needle and the painted wire which supports it. Sometimes pieces of paper, like wings, have been stuck to the lower surface of the card which, by offering a resistance against the air in the box, check in some measure the irregular movements of the card.

In the year 1779, Dr. Ingenhousz presented a paper to the Royal Society, which is published in the 46th vol. of the Philosophical Transactions, and in which he describes some experiments, made by magnetic needles in water, where he found that a strong magnetic needle placed itself in the magnetic meridian, nearly as well under water as in the open air, and that by the resistance of the medium, much of its too great veratibility was taken away. In consequence of these experiments the Dr. proposed to enclose the magnetic needle in some fluid for the use of vessels. "Common water," he says, "would be, perhaps, the best medium for these different contrivances, if kept not so easily touched by it, and if in cold weather water was not so apt to freeze; therefore, I think, that some of the thinnest expressed oils would answer the purpose better. The glass season containing such a compass should be full of the liquid to the cover, to obstruct undulating motion." But though this proposal appeared at first very promising, and some eminent philosophical instrument-makers were much struck with it; yet it does not appear that it was ever adopted.

The use of the compacts in general is to direct a person along any required track, which makes a known angle with the direction of the magnetic needle; and this renders the compacts applicable to a variety of purposes; thus it guides travellers in defects, as in Arabia, in the woods of America, &c.; it enables the navigator to proceed in any required track; it is highly useful to the miner, by showing the direction of subterranean places; it serves for measuring horizontal angles; hence it is useful in land surveying, taking plots, finding bearings in dialling, &c. And briefly it serves to set fun-dials, and other astronomical instruments when no great accuracy is required. The application of the compacts to these purposes is too obvious, as not to require any further illustration. But for some of these purposes, sights must be applied to it, in the azimuth compacts.

The azimuth compacts is a fleeting compacts of any of the above-mentioned contractions, to which two sights are adapted, through which the sun is to be seen, in order to find its amplitude or its azimuth, whence the declination of the magnetic meridian from the true or astronomical meridian may be determined; those two meridians follow coinciding. At present (1807) in London, the declination of the magnetic needle is about 24° west; that is, the northern extremity of the magnetic needle, points to a part of the heavens, which makes an angle of about 24° with the true North, but the declination is different at different times in the same place; as well as at different places at the same time.

The more usual fort of azimuth compacts is represented in fig. 15, where \( F, \ G \), are the sights, or sight-vcnes, in one of which, \( G \), there is an oblong aperture, with a perpendicular thread or wire through its middle; and underneath it, \( F \), there is a narrow perpendicular slit. A thread or wire, \( H, I \), is stretched from one side of the edge of the box to the other. The ring \( A \) of the gimbals rests with its pivots on the semicircle \( CD \), the foot, \( E \), of which turns in a socket, \( D \), that whilst the box, \( KLM \), remains steady, the compacts may be turned round, in order to place the sights, \( F \), \( G \), in the direction of the sun, or other celestial object. The pivots of the gimbals of this, as well as of the fleeting compacts in general, should lie in the same plane with the point of suspension of the needle or card, for the purpose of avoiding the irregularity of its vibrations as much as possible. In the inside of the box there are two lines drawn on its sides perpendicularly down, from the points where the thread, \( H, I \), touches the edge of the box. These lines serve to show many degrees the north or south pole of the needle is distant from the azimuth of the sun; on which account the middle of the apertures in the sight-vcnes, \( F \) and \( G \), the thread \( H, I \), and the above-mentioned two lines must stand exactly in the same vertical plane. The use of the thread \( H, I \), which is sometimes omitted in compacts of this sort, is to show the degrees between the magnetic meridian and the azimuth, &c., when the eye of the observer stands perpendicularly over it. On one side of the box of the azimuth compacts, there generally is a nut or stop, which, when pulled in, bears against the card and stops it; and this is done for the purpose of reading that degree, half degree, &c., of the card, which coincides with one of the perpendicular lines in the inide of the box.

Mr. M'Culloch's azimuth compacts is represented in fig. 16, where \( b \) is the compacts-box, \( b \) one of the guards, \( e \) the prop, which stands in a brafs socket, and may be turned round at pleasure, \( r \) is a brafs bar upon which the sight-vcnes are fixed; 2, a dark glass, which moves up or down on the sight-vcne \( 3 \); 4 is a magnifying-glass, which is also moveable on the other sight-vcne; 5 is the nunus or vernier; 6 is a file for moving the vernier so as to flop the card in taking the azimuth; and 7 a double convex glass, through which the divisions on the vernier may be read with accuracy.

In order to observe at sea the magnetic amplitude of a celestial object (via its bearing by the compacts when in the horizon) with the azimuth compacts, place the instrument on a steady place, whence the horizon may be clearly seen; and looking through the sight-vcnes of the compacts, turn the instrument round, until the centre of the sun's disk, or other celestial object, may be seen through the narrow slit in one of the sight-vcnes exactly on the thread which bisects the other sight-vcne; and at the instant that the centre of the celestial object, whether rising or setting, is in the horizon, push the flop in the side of the box, so as to flop the card, then read the degree, half degree, &c. of the card, which stands against one of the perpendicular lines in the inside of the box, and this is the magnetic amplitude sought. — In this observation, some allowance must be made for the height of the observer's eye, above the level of the sea.
then

The true amplitude of the celestial object is an arch of the horizon contained between the east or west points of the horizon, and that point of the horizon which the centre of that celestial object cuts in its rising or setting. In order to find the true amplitude of the celestial object, the latitude of the place of observation, and the actual declination of that object, must be known; then lay, as the cosine of the latitude is to radius, so is the sine of the declination to the cosine of the amplitude sought.

To observe at first the magnetic azimuth of a celestial object, (viz. its bearing by the compass when above the horizon,) situate the instrument in a steady place, and looking through the narrow slit in one of the right vanes, turn the box r. and until the centre of that object appears to coincide with the thread in the slit of the other right vane, or till the shadow of that thread, when the sun is observed, falls exactly along the line on the surface of the compass-box, and at that instant drop the card; then read the degree, &c. as above directed with respect to the amplitude, and thus you have the magnetic azimuth of that object. The true azimuth of that object is an arch of the horizon intercepted between the north or south point, and that point in which a plane passing through the zenith and the celestial object, cuts the horizon. In order to find this azimuth, the latitude of the place of observation, the declination of the celestial object and its altitude must be known; and hence to determine the declination of the magnetic needle, this true azimuth of a celestial object must be taken at the same time that its magnetic azimuth is taken; therefore the altitude of that object must be taken with a sextant, at the very instant that its magnetic azimuth is taken, and at the time the card is dropped; then proceed in the following manner: If the declination and latitude be both north or both south, call the declination $A$; but if they be one north and the other south, add $90^\circ$ to the declination, and call the sum $A$. Call the difference between the co-latitude and co-altitude $B$. Let the half of the sum of $A$ and $B$ be called $D$; and the half of their difference be called $C$; then add together the four following logarithms, viz. the arithmetical complement of the logarithmic sine of the co-latitude, the arithmetical complement of the logarithmic sine of the co-altitude, the logarithmic sine of $D$, and the logarithmic sine of $C$. Half the sum of these four logarithms is the logarithmic sine of half the azimuth sought.

Now, having shown how to find the true and the magnetic amplitudes as well as azimuths, we shall briefly add the method of determining from them, the declination of the magnetic needle for the time and place when and where the observations are made. Let the amplitudes, as well as the azimuths, be all reckoned from the north point, which is affected by intracting the amplitude from $90^\circ$ when it is on the northward of the east or west points; or by adding it to $90^\circ$ when it is southward of the east points. Then the magnetic amplitude is either smaller or greater than the true amplitude. When the magnetic amplitude is less than the true, and they are both on the same side of the north point, their difference is the declination of the magnetic needle towards the contrary side of the north point. But if they be on different sides of the north point, then their sum is the declination towards the same side with the true amplitude. When the magnetic amplitude is greater than the true, and they are on the same side of the north point, their difference is the declination towards the same side with the true amplitude. But if they be on different sides, then their sum is the declination towards the same side with the true amplitude. Thus, for example, if the magnetic amplitude is $80^\circ$ eastward of the north point, and the true amplitude is $82^\circ$ towards the same side; then the declination is $2^\circ$ east. And if the magnetic amplitude be $50^\circ$ eastward of north, whilst the true amplitude is $50^\circ$ westward of north, then the declination is $80^\circ$ west. The same directions, mutatis mutandis, are to be followed for finding the declination from the magnetic and true azimuths.

Ever since the discovery of the declination of the magnetic needle from the true meridian, which appears to have been first observed by Columbus in his first voyage towards the continent of America, in the year 1492, the cause of that phenomenon has been earnestly sought after by inquisitive persons in the scientific world; and especially when it was found that this declination varies continually, in a manner, which has not, as yet, been reconciled to any theory. The most promising method of investigating the subject appeared to be that of observing attentively the daily, and even the hourly, variation of the declination, in order to discover, if possible, any period in it, or any dependence of it upon other natural phenomena. And in fact, the late ingenious Mr. Canton, who made numerous observations relative to the subject, found a periodical increase and decrease of the magnetic variation, in great measure corresponding with the temperature of the different parts of a natural day. For this purpose accurate compasses were fixed in various observatories, and the variation of the magnetic needle has been observed, at least once every day, for a great many years; such observations having frequently been inserted in meteorological journals, and elsewhere.

The variation of the needle being intended to show the daily variation of the magnetic needle upon land, is generally made longer than those that are used at sea; and, as it is not necessary to turn it round, the box generally is of an oblong form, so that the angular motion of the needle on it may amount to about $40^\circ$ or $50^\circ$. The divided arches are either within the box, concentric with the point of suspension of the needle; or out of it, on a frame, the particular construction of which will appear from the description of the variation compass of the Royal Society of London, which will be given presently. When the divided arches are within the box, in which case a nonius is often placed on one extremity of the needle, the variation is known by observing the division which coincides with the axis of the needle. In either construction, it is evident that the beginning of the divisions of the arch or arches must be placed exactly in the meridian of the place; or else its deviation from the meridian must be accurately known and allowed for in reading the degrees of magnetic variation. And it is almost superfluous to add that such compasses must be situated in very steady places, out of the influence of iron; so much so that it will be proper for the observer, when he examines the compass, &c. to take out of his pocket, keys, knives, or any other article of iron and iron; for otherwise the needle will feebly alter the direction of the needle. We shall now finish the particular descriptions of two variation compasses of the best construction, viz. of that which is used at the Royal Society, and is described by the honourable Henry Cavendish, in the 66th vol. of the Philosophical Transactions; and of that which was contrived by Mr. Cavollo, and is described in his "Treatise on Magnetism," the former of which, being much larger, is well calculated for a fixed observatory, whilst the latter is smaller, more compact, and may be fixed in any place.

Fig. 17, is a plan of the Royal Society's variation compass. "In this instrument, the box which holds the needle is not fixed, but turns horizontally on a centre, and has an index attached to it, pointing to a divided arch on the brass frame on which it turns; and the method of observing is to move
move the box, till a line drawn on it points exactly to the end of the needle; which being done, the angle that the needle makes with the side of the frame is shown by the index. \(A Bb a\) is the frame, the sides \(A B\) and \(ab\) being parallel: \(E E\) is a circular plate fastened thereto, on which \(CD/e\), the box which holds the needle, turns as on a centre; \(N n\) is the needle, the pin on which it vibrates being fixed in the centre of the plate \(E E\); \(B b\) is the division on the frame; and \(G G\) the index fastened to the box, \(CD/e\), furnished with a vernier division; the division and vernier being connected so as to show the angle which the line, \(F G\), makes with \(A B\), or \(a b\). The instrument is placed in the meridian by the telescope, \(M M\), the line of collimation of which is parallel to \(A B\), and is pointed to a mark fixed due north of it. \(F g. 18\), is a vertical section of the instrument passing along the line \(F G\); \(A B\) is the frame; \(C D/e\) is the box which holds the needle; \(E E\) is the circular plate on which it turns; \(N n\) is the needle; \(P\) and \(p\) are small plates of brass fixed to the ends of it, on each of which is drawn a line serving as way of index. These pieces of brass are raised to such a height that their tops are on a level with the point of the pin on which the needle turns. The use of them is, that it is much easier observing this way, than when the lines, serving as way of index, are drawn on the needle itself, as this means the inconvenience proceeding from one kind of vibration in the needle is avoided. \(S\) and \(s\) are two brass plates, on each side of which is drawn a line, to which the index at the end of the needle is to point; there is also a line parallel to these, drawn on the bottom of the box; these three lines form the line, \(F G\), in \(f g. 17\). \(R\) is a double microscope intended to aid us in judging when the index, \(P\), points exactly to the line, \(F\), that is, to the line drawn on the plate \(S\). It is placed so that a wire, \(W w\), in its focus, appears to coincide with this line; and in observing, the box is moved till the wire appears also to coincide with the index \(P\). The cap in the centre of the needle is made to take on and off readily, and to fit on upon either face; so that we may on occasion observe with the under face of the needle uppermost. The intention of inverting the needle is to show whether the axis of the figure of the needle coincides with its magnetic axis.

The figures 19 and 26, exhibit a vertical view, and a section of Mr. Cavallo's variation-compass, and those representations are two thirds of the real size of the instrument. The letters of reference indicate the same parts in both figures. \(A B D\) is a brass frame with a circular brass piece, \(cei\), screwed fast upon it. \(F G H K\) is a rim likewise of brass, that slides on the outside of the circular piece \(cei\), and to which the flat glass, \(M\), is fastened; so that when the rim is removed, the glass comes off with it. The shape of the needle is clearly indicated by the figures. It has a hole in the middle to receive the agate cap, which is burnished into a brass socket, and is so situated into the needle, that the upper surface of the eye lens does not rise higher than the surface of the needle; hence the point of tinfoil upon the pin, \(B\), is even with the upper surface of the needle. By this means the pendulum-like oscillations cannot disturb the direction of the line of the fine lines marked on the extremities of this needle. The upper and lower surfaces of this needle are quite alike, and the brass socket, which contains the agate cap, is made so as to admit of the needle's being turned with either of the surfaces uppermost. The hole in the middle of the needle is one, cylindrical, and so is the outside of the brass socket, which fits the said hole exactly, but projecting a little way beyond the needle, has a few cut on that projection, upon which another circular piece of brass is screwed to fix it, as may be seen in fig. 20. It is evident, therefore, that when the last-mentioned piece of brass is unscrewed, the socket with the agate cap, may be put in on either side of the needle, and may be fastened on the opposite side of it. By this means a great source of error may be avoided, namely what arise from the magnetic axis of the needle being not in the axis of its figure, which is frequently the case; for, if the direction of this needle be observed with one side of it upwards and then (the needle being turned) be observed again with the other side upwards; either the second observation coincides with the first, and then we may conclude that the magnetic axis of the needle is truly in its middle; or the observations differ, and hence we shall know that the magnetic axis of the needle is not in the axis of its figure; but in this case we may have the real magnetic direction by taking a mean of the two observations; or we may thereby ascertain, once for all, how much the line of direction of the needle deviates from its magnetic axis, which, when once ascertained, becomes a fixed quantity to be either subtracted from, or added to any other observation."

"The upper side of the circular piece \(cei\) is silvered, and divided into degrees and half degrees; but those divisions, being too minute, are omitted in the figure. The bottom \(A D D\) has two projections, \(A\) and \(D\), opposite to each other, and on each of their chamfered edges a line is marked, which, being drawn at the same time that the circle, \(cei\), is divided by the circular dividing engine, coincide exactly with the commencement of the numerator of the degrees on the opposite sides of the circle, from which places the degrees run on both sides as far as 90°. The needle, therefore, which lies with its upper surface even with the divided circle, points to the same degree and part of a degree with both its extremities."

"We come now to describe the method of measuring the parts of a degree on the circle, which is only divided into half degrees. This is obtained by means of the microscope, \(f g. 21\), which is furnished with one of my mother-of-pearl micrometers. (Phil. Trans. vol. 71.) The external construction of the microscope, and likewise the manner of placing it perpendicularly upon the compass box, are indicated by \(f g. 21\), at \(N\) in \(f g. 19\); and by the dotted lines at \(K\) in \(f g. 20\). \(P\) is a short tube supported by the uprights \(P, R\), the lower parts of which project horizontally. These horizontal projections, \(O, O\), are notched at \(Y\), so as to fit the mouldings, \(H, K\), of the rim \(F G H K\), when the parts, \(O, O\), rest upon the glass. By this means the microscope may be moved all round the compass-box, whilst it keeps some of the divisions of the circle always in the field of view. The body of the microscope may be moved up and down in the tube \(P\), in order to adjust it for distinct vision. It consists of the tube \(S S\), into the upper part of which slides a short cylindrical tube \(T\), and at its lower extremity, \(H\), a lens is fastened. Two other lenses are fixed into the tube \(T\), which is about nine-tenths of an inch long, and within it; viz. exactly in the focus of the eye-lens, the mother-of-pearl micrometer is situated. Those three lenses are all of the plano-convex sort. The focus of the upper one is about four-tenths of an inch, and the focus of the second and third is about five-tenths of an inch. The divisions of the micrometer are about four-thousandths of an inch, and when viewed through the microscope, and the micrometer is placed upon the compass, all of them appear to be exactly equal to half a degree on the circle \(cei\). But there is no need for these divisions to be exactly
COMPASS.

Three of an inch. It is sufficient if they are nearly so, as, for instance, from about 280 to 320 in an inch; because by pulling the tube T more or less out of the tube S, and by moving the said mentioned tube up or down into P, the divisions of the circle may be magnified more or less, till 15 divisions of the micrometer appear to be exactly equal to the space between any two contiguous divisions on the circle; viz. to half a degree. When the micrometer has been once so adjusted, it requires no farther alteration, excepting to be moved round the box until it comes over the end of the needle, in which situation the field of view appears as shewn in fig. 22, where the middlemost part is occupied by the micrometers 1, 2, 3, 4; the other large divisions are the magnified divisions of the circle, and W is the extremity of the needle, with its directive line pointing to some division on the micrometer.

"Fifteen divisions of the micrometer being equal to half a degree, or to 30', it follows that each division is equal to two minutes, and as it may be easily discerned whether the line on the end of the needle is directed exactly to one of those divisions or midway between two of them, therefore the direction of the needle in this compass may be read off to a single minute. In order to observe the daily variation, when this compass is properly fixed, the micrometer need not be moved, because its field of view takes in about two degrees, which is a much greater space than the needle will go through in ten years time. In moving the micrometer round the box, care must be taken to place it so that the divisions of the circle may appear to coincide with some of the long divisions of the micrometer. — N. B. This micrometer inverts the objects; therefore what appears to be on the right hand must be understood to lie on the left, and vice versa."

"In order to observe the real direction of the magnetic needle, or the daily variation, the compass must be placed so as that the two lines marked on the projections A and D, fig. 19, may coincide with a meridian line drawn upon a board, a stone, a block, &c. and then the degrees and minutes, to which the extremity of the needle is directed, will shew the required variation."

Having, in the preceding paragraphs, mentioned all the important particulars relating to the discovery, the construction, and the use of one of the most remarkable, and the most useful, philosophical instruments, we shall conclude by mentioning a deception which has sometimes been offered to the credulous and unskilled part of mankind. It is a compass, or a magnetic needle which was pretended to point due north and south, without any variation at any time or place; and compasses apparently of this description have actually been offered for trial and have even been sent abroad. But upon examination it has been found either that the north and south points of the card were not placed over the north and south points of the needle; or that the needle, having been made purposely broad, had been magnetized so that the direction of its poles made an angle with the axis of its figure, just equal to the magnetic declination at that particular time and place. The consequence of this artifice is, that though the needle may appear to have no declination at that particular time and place; yet at any other time, or if moved to another place where the magnetic declination is different, its direction will deviate from the true meridian. The declination or variation, like the attraction and repulsion, belongs to every piece of magnet, be it natural or artificial, and the magnetic needle is of the latter sort; nor can, at the same time and in the same place, one needle point to one part of the heavens whilst others point to a different part; provided they be freely suspended, and be uninfluenced by iron or other magnets.

COMPASS of voices, in Music. In early times of counterpoint, human voices of different compass, occasioned by age, sex, and natural organ, were cliified and divided into four distinct kinds, at the distance only of a third above each other, which the base, or F clef, placed from one line to line, expressed. The lowest of these was called the tenor, the next contratenor, motetus the third, and tripulum the highest, or treble; of which term this was the origin.

After this, about the middle of the fifteenth century, as different parts began to be multiplied, the scale received fix divisions: base, baritone, tenor, contralto, mezzo soprano, and soprano. The natural pitch of these is about three or four notes above each other, as their several clefts, which originally served as barriers, will discover.

It seldom happens that a voice has more than ten real, steady, and full, natural notes, in its compass, without a mixture of falset, which, being of a different register, is easily discovered. The following are the names and usual extent of the several species of human voice.


But as there are sometimes base voices which go down to double F, and even lower; so there are in the treble, among modern vocal phenomena, fingers that go higher than E in altissimo; which make the whole diapason of voices exceed four octaves. And there is at present 1802 in England, a German buffo finger with a base voice that goes down to double gammut in real musical tones; and in falset, up to G on the second line in the treble. No public use was made of this extraordinary voice. He arrived in autumn, when no theatres were open, and remained but a short time.

But though parts in choral music were multiplied, not only to fix, but even thirty-six, before the clef of the fifteenth century; yet the general, and established number, in the pope's chapel, by which probably all other choral service was regulated, amounted to no more than four: cantus, altus, tenor, and base; which fee severally.

If it be asked why so many clefs are used? It may be answered, to keep the melody of these several voices within the compass of the five line staff; to prevent the perplexity of a great number of leger-lines, which in singling and playing at sight, frequently alarm and embarrass the performer.

Of all the expedients proposed by speculative and ingenious men, for the abolition of tenor clefs, the only one that seems practicable, and has the merit of great simplicity, was published in our own country in the time of Charles II. under the title of "An Essay to the advancement of Music", by clearing away the perplexity of different clefts; and uniting all arts of music, lute, viols, viols, organ, harpsichord, voice, &c. in one universal character, by Thomas Salton.
This book is well written, and, though very illiberally treated  
by Locke, Playford, and some other professors, contains nothing  
that is either absurd or imprecaibilis: nor could I discover,  
says Dr. Burney, any other solid objection to its doctrines  
being adopted, than the effect it would have upon old  
music; by soon rendering it unintelligible. At present  
the tenor cliff alone is thought an insuperable difficulty in our  
country, by Diletanti performers on the harpsichord; but  
if Salmon's simple and easy musical alphabet were chiefly  
in use, the basic cliff would likewise be soon rendered as obso-

tele and difficult as the tenor; so that two parts or cliffs out  
of three, in present use, would become unintelligible. The  
author's plan was simply this: instead of the eight or nine  
ciffs that were then in use, as,  

\[ \begin{align*}  
& \text{G in every part of the scale being on the first line, } a \text{ on the}  
& \text{first space, } b \text{ on the second line, &c. the letters preceding}  
& \text{each leptonary implying base, mean, treble, suprême. To}  
& \text{this proposal there seems no cogent objection; professors}  
& \text{would not be humbled by having any thing to learn. The}  
& \text{base cliff, which every tyro knows, repeated in octaves,}  
& \text{without changing a single name or character, would accom-}  
& \text{plish the whole business. The principal evil, and a great}  
& \text{evil it would be, is the certainty of soon rendering all former}  
& \text{music, printed or in manuscript, obsolete and unintelligible.}  
& \text{This has been effected in a great measure, lately, by new}  
& \text{editions of the harpsichord and organ music of the 14th}  
& \text{century, and the total rejection of every tenor cliff in music for}  
& \text{keyed-instruments; of which we have already pointed out}  
& \text{the inconvenience. See Accompaniment and Cliff.}  
\end{align*} \]

Compass of proportion. See Sector and Proportion.

Compass dials, are small dials, fitted in boxes, for the  
pocket, to shew the hour of the day by direction of the  
neddle; which indicates how to place them right by turning  
the dial about, till the cock or style stand directly over  
the needle, and point to the northward; but these can never  
be very exact, because of the variation of the needle itself.  
See Dial.

Compass Screw. See Saw.

Compasses, or pair of Compasses, a mathematical  
instrument, used for the describing of circles, measuring  
lines, &c. The common compasses consist of two branches  
or legs, or iron, brass, or other metal, pointed at bottom;  
and joined by a twist, whereon they move, as on a centre.  
These are reckoned the best, p’ot of whole joint is steel,  
and where the pin or which the joint turns is a steel screw.  
The points should also be made of hardened and polished  
steel. In some the points are fixed; in others they may be taken  
of a drawing-pen, pencil, or dotting wheel,  
embedded in their room.

The invention of compasses is ascribed to Talus, nephew  
of Dædalus, by his flider, whom, the poets say, Dædalus  
killed out of envy. We have compasses now of various  
kins and contrivances, accommodated to the various uses  
they are intended for; as,

Compases of three legs, or triangular compasses. Their  
structure is like that of the common compasses, letting aside  
the excess of a leg, which has a motion every way; their  
use is to take three points at once, and so to form triangles:  
to lay down three positions of a map to be copied at once,  
&c. Two of the legs A, B (Plate, Compasses, fig. 1.)  
are jointed together like a common pair; the pin a, which  
connects them, has another leg D, jointed to it; the legs,  
A, B, are first set to two of the points, and the leg D is  
then moved farther from, or nearer to, the other legs by  
bending its joint; or it is turned round the pin a of the  
other legs as a centre, as occasion may require.

Fig. 2, is another construction of the triangular  
compasses. A, B, C, are three arms, at whose ends are jointed  
the arms a, b, c, carrying steel points; they are of such  
lengths, that when closed they shall nearly meet in one  
point; by opening them as in the figure, they can be made  
to coincide with any three points within the reach of the arms.  
Compasses, Beam, consist of a long branch, or beam,  
carrying two or three cursors; the one fixed at one end, the  
other sliding along the beam, with a screw to fasten it, on  
occasion. To the cursors may be screwed points of any  
kind; whether steel, pencils, or the like. To the fixed  
cursor is sometimes applied an adjusting or micrometer  
screw, by which an extent is obtained to vary great nicety.  
Mr. Ramírez constructed compasses of this kind whose  
micrometer screw shows very perceptibly a motion of 1/1000  
part of an inch. It is used to draw large circles, to take  
great extents, &c. See Plate, Compasses, fig. 3, which  
exhibits a common pair of beam compasses. A A is a fixed  
branch, or mahogany, made very straight and true; B, D  
are two frames of brass, sliding on the bar, that can be  
separated at any place by a clamp screw a b, at the top of  
each; e f are two pieces into which are inserted the points,  
and are fastened by a screw; the sliding frame B has a  
colar g screwed to it, in which the screw h, with a divided  
head, turns; this screw is tapped into a piece of brass  
fastened at the end of the mahogany bar, so as to move  
the point at f very slowly when the screw is turned.

Compasses, Bow, or Boxes, are a small sort of com-

\[ \begin{align*}  
& \text{G in every part of the scale being on the first line, } a \text{ on the}  
& \text{first space, } b \text{ on the second line, &c. the letters preceding}  
& \text{each leptonary implying base, mean, treble, suprême. To}  
& \text{this proposal there seems no cogent objection; professors}  
& \text{would not be humbled by having any thing to learn. The}  
& \text{base cliff, which every tyro knows, repeated in octaves,}  
& \text{without changing a single name or character, would accom-}  
& \text{plish the whole business. The principal evil, and a great}  
& \text{evil it would be, is the certainty of soon rendering all former}  
& \text{music, printed or in manuscript, obsolete and unintelligible.}  
& \text{This has been effected in a great measure, lately, by new}  
& \text{editions of the harpsichord and organ music of the 14th}  
& \text{century, and the total rejection of every tenor cliff in music for}  
& \text{keyed-instruments; of which we have already pointed out}  
& \text{the inconvenience. See Accompaniment and Cliff.}  
\end{align*} \]
COMPASSES, that shut up in a hoop, which serves for a handle. Their use is to describe arcs, or circumferences of circles of very small radius. Fig. 4, is a small pair of compasses, with a screw for measuring small distances very accurately, and describing small circles: a is one of the points fastened to a socket, in which the screw b works; d is a steel-bar attached to the same socket; e is a piece sliding on the bar d, and carrying the other point; it has a projection above it, in which the screw works; f and g are two pieces jointed to the points at one end, and to a small handle h, at the other, which is used to hold them by. The head f of the screw is divided into equal parts, which divisions are read against a projecting part of the piece, holding the point a, and by turning it round one of the divisions, the points are moved some fractional part of an inch, as 1/16, or 1/16, according to the number of threads in an inch of the screw's length, and the number of divisions on the head of the screw.

COMPASSES, Caliber. See Caliber.

COMPASSES, Clock makers. Are very subtiltantial, serving to cut paperboard, bras, &c. jointed like the common compasses with a quadrant, or bow, as the spring compasses, only its use is different; as serving here to keep the instrument firm at any opening. See Clock.

COMPASSES, cylindrical and spherical, used in taking the diameter, thickness, or caliber of round or cylindrical bodies, such as cannon, balls, pipes, &c. They consist of four branches joined in a centre, two of them circular, and two flat, a little bent at the ends.

To use them, one of the flat points is put within the cannon, the other without; the two opposite points show the thickness. See Caliber Compasses.

There are also spherical compasses, differing in nothing from the common ones, but that their legs are arched, serving to take the diameters of round bodies, &c. Another sort of compasses has been lately invented, for measuring the diameter of round bodies, as balls, &c. which consist of two flat pieces of metal, set at right angles, in a straight bar or beam of the same; the one being fixed, and the other sliding along it, so far as just to receive the round body between them; and then its diameter, or distance between the two pieces, is shown by the dividers marked on the beam.

COMPASSES, Elliptic. Their use is to draw ellipses, or ovals of any kind: they consist of a beam A B (Plates, Compasses, fig. 5,) about a foot long, bearing three cursors; to one of which may be fixed two points of any kind: to the bottom of the other two are riveted two sliding dove-tails, adjusted in grooves made in the crofs branches of the beam. The dove-tails having a motion every way, by turning about the long branch, go backwards and forwards along the crofs; so that when the beam has gone half-way about, one of these will have moved the whole length of one of the branches; and when the beam has got quite round, the same dove-tail has got back the whole length of the branch. Understand the name of the other dove-tail.

Note, the distance between the two sliding dove-tails is the distance between the two foci of the ellipse; so that by changing that distance, the ellipse will be rounder or flender. Under the ends of the branches of the crofs are placed four flet points to keep its fall.

The use of this compass is easy; by turning round the long branch, the ink, pencil, or other point, will draw the ellipse required. Its figure shews both its use and construction.

COMPASSES, German, whose legs are a little bent outwards towards the top; so that, when shut, only the points meet.

COMPASSES, Hair, so contrived within file, as to take an extent to a hair's breadth. The outward appearance of the hair compasses is like that of a common pair of compasses; the peculiarity consists in one of the legs A, being attached to the brass by a spring B (Fig. 6), whose action throws the leg inwards, and is counteracted by a small screw D; by turning which the leg can be moved small distances, and let to the greatest nicety, without moving the joint.

Fig. 7, represents a pair of pocket compasses, the legs, a, b, of which are hollow, and contain, the one a pen, c, and the other a port crayon, at, at the opposite end of each point, f and g.

COMPASSES, Lapidary's, a piece of wood in form of the shaft of a plane, clinet a-top, as far as half its length; wherein they measure the angles, &c. of the precious stones, as they cut them. In the clinet is a little brass rule, fastened there, at one end, by a pin; but so that it may be moved in the manner of the bevel; with this kind of square they take the angles of the stones, laying them on the shaft as they cut them.

COMPASSES, Proportional, are those whole joint lines between the points terminating each leg; they are either simple or compound. In the former sort the centre is fixed, so that one pair of these serves only for one proportion.

COMPASSES, Compound proportional, consist of two branches (see Fig. 8,) each pointed at either end with steel: the length of the branches is cut through, for a cursor to slide up and down; in the middle of which cursor is a screw, serving to join the branches, and to fix them at any point required.

On the one leg are divisions, serving to divide lines into any number of equal parts, for reducing of figures, &c. On the other are numbers, for inscribing any regular polygon in a circle proposed.

The use of the first is easy: Suppose v, gr., a right line required to be divided into three equal parts; push the cursor till the screw be just on the figure 3; where fixing it, take the length of the given line between the two longest parts of the legs; the distance between the two shortests will be one third of the given line. In the same manner may the line be divided into any other number of parts.

For the use of the line of polygons: Suppose, v, gr., a pentagon required to be inscribed in a circle; push the cursor till the middle of the screw be against 5, the number of sides in a pentagon; between the shortest part of the legs take the femidiameter of the circle: the legs thus opened, the distance between the points of the longest parts will be the side of the pentagon to be inscribed in the circle. And thus for a figure of any other number of sides.

Fig. 9, is a pair of proportional compasses; the bras part of the two legs A, B, have longitudinal openings in them, for the pin, round which they move as a centre, to slide in, and can be fixed at any place by a screw e, so that the distance from the centre to the points e, d, shall be twice, three times, or in any other aliquot part of the distance to the points e, f, and of course the openings at each end will be in the same proportion.

Fig. 10, represents a method of adapting a quick and smooth motion to a pair of the compasses; a is a brass bar, with an oblong opening cut in it, to receive a screw, b, fastened to one leg of the compasses; the other end of the bar, d, is cut into a screw, with a fine thread, and has a nut, f, on it, turning in a collar jointed to the other leg of the compasses. When the screw, b, is loose, the compasses can be set to any opening; but when it is fast, they can only
be moved by turning the nut. The screw, \( t \), is put into a hole in one of the legs of the compasses, so that it can easily be removed, and inserted into a hole made in the moveable centre, to give it a slow motion if required.

**Compasses, Proportional, with the Sector lines.** The structure of these is so like that of the common proportional compasses, only a little nicer, that it needs no particular description. See sect. 1.

The lines on the first face are the line of lines, marked lines: it is divided into 100 equal parts, every tenth numbered: and the line of chords, which goes to 60°, is marked chords.

On the other face are a line of lines to 90°, and a line of tangents to 45°. On the other side are the tangents from 45° to 71° 34′; on the other, secants from 0° to 70° 30′.

*For the use of these compasses:* 1. To divide a line into any number of equal parts, less than 100: divide 100 by the number of parts required; flip the cursor till the line on the sliding dovetail be against the quotient on the line of lines; then the whole line being taken between the points of the compasses, will remote from the centre, the aperture of the other will show the division required. 2. A right line given, supposed to be divided into 100 parts, to take any number of these parts; flip the line on the sliding dovetail to the number of parts required; the whole line being taken between the points farthest from the centre, the aperture of the other two will include the number of divisions required. 5. The radius being given, to find the chord of any arc under 60°; if the line on the sliding dovetail to the degrees required on the line of chords; the radius being taken between the points farthest from the centre of the cursor, the aperture of the other line will be the chord required, provided the number of degrees be greater than 29; if it be less, the aperture taken from the radius will leave the chord required. 4. If the chord of an arch under 60° be given, and the radius required, flip the line on the dovetail to the degrees given on the line of chords; the given chord being taken between the two points next the cursor, the aperture of the other will be the radius required. 5. The radius being given, to find the sine of any number of degrees. Slip the line on the dovetail to the degree on the line of lines whose sine is required; the radius taken between the points farthest from the cursor, the aperture of the other will give the sine of the angle required. But if the sine sought be less than 30°, the difference of the sines of the opposite points will be the sine required. 6. The radius being given, to find the tangent of any number of degrees under 71°: if the tangent required be under 29° 50′, then flip the line on the dovetail to the degree proposed on the tangent line; the radius taken between the points farthest from the cursor, the aperture of the other will be the tangent of the degrees required: if the tangent required be above 29° 50′, but under 45°, the line on the cursor must be flipped to the degrees given on the tangent line; then the radius being taken between the points farthest from the cursor, the aperture of the other will be the tangent. If the tangent required be greater than 45°, but less than 56° 20′, flip the notch on the tangent side of the turned cheek to the degree 0 on the tangent line on the side of the compasses; the radius taken between the points farthest from the cursor; the difference between the aperture of the other, and these, added together, will be the tangent required. Thus, for the tangents of other degrees under 71. After the like manner may the secant of any number of degrees under 71 be found.

Mr. Heath, a mathematical instrument-maker in London, constructed a pair of proportional compasses in 1746, with a curious and useful contrivance for preventing the shorter legs from changing their position, when these compasses were used. It consisted of a small beam soldered to a screw, and running parallel to the leg of the compasses, nearly of the length of the groove; in this beam a flat was made, which admitted of a sliding nut, the other end of which fell into a hole in the bottom of the screw, belonging to the great nut of the compasses. The screw-pin of the beam passed through an adjuster, by means of which the mark on the slider might be brought exactly to any division. But the proportional compasses have been much out of use since the invention of the sector, which see.

**Compasses, Spring, or Dividers, are made of hardened steel, the head arched; which, by its spring, opens the compass; the opening being directed by a circular screw, fastened to one leg, and let through the other, worked with a nut.**

**Compasses, Triangular.** See Compasses of three legs, and Triangular.

**Compasses, Trisecating, the invention of M. Tarragon, for the trisection of angles, geometrically.**

The instrument consists of two central rules, and an arch of a circle of 120 degrees, immovable, with its radius; the radius is fastened with one of the central rules, like the two legs of a sector, that the central rule may be carried through all the points of the circumference of the arch. The radius and rule must be as thin as possible; and the rule fastened to the radius hammered cold, to acquire an elasticity; the breadth of the other central rule must be triple the breadth of the radius. In this rule there is a groove, with a dovetail, to be fastened on it, for its motion; in the centre of each rule must likewise be a hole. See the Journ. des Scavans, Sept. 1688.

**Compasses, Turn-up, a late contrivance to save the trouble of changing the points; the body is like the common compasses; towards the bottom of the legs, without fibre, are added two other points, besides the usual ones; the one carrying a drawing pen-point, the other a port-crayon; both joined so as to turn round, and so be in the way of use, or out of it, as occasion requires.**

The points of small compasses are tempered by a lamp and blow-pipe, heating them red-hot; when cold, they are hard: the larger are tempered by a charcoal fire and a blow-pipe, heating them to a cherry colour, then plunging them in water.

See M. Bion's Construction and Uses of Mathematical Instruments, by Stone; and Robertson's Treatise on the same subject.

**COMPASSEMENT de feux,** in Military Language, a manner of fixing the distances between the chambers of mines, and dipping of the fuse-threads, so as to communicate the fire to them at one and the same instant of time.

**COMPASSING,** in Naval Architecture, a term used to denote such pieces of timber as are incrusted into the figure of an arch.

**COMPASSING the king's death, in Law.** See Treason.

**COMPASSION,** in Ethics, a mixed passion, compounded of love and sorrow, and excited by the sight or recital of distress: or, as Dr. Hartley concretely defines it, it is the uneasiness which a man feels at the misery of another. Accordingly he traces it to several affections, both in children and adults, upon which it seems to be grounded; and he observes, that persons, whose nerves are easily irritated, and those who have experienced great trials and afflictions, are in general, more disposed to compassion than others; and that we are most apt to pity in those distresses and calamities which
which we either have felt already, or apprehended ourselves in danger of feeling hereafter. A compassionate temper, says this writer, being great matter of praise to those who are ended with it, and the actions which flow from it being a duty incumbent on all, men are led to praise these actions, and to incite upon themselves the motives of compasion, by attending to difkets, actually present, or defended in history, real or fictitious.

Hobbes makes this a merely selfish passion, and defines it, as being for our selves; Hutcheson refutes it into instinct; but Dr. Butler much more properly considers compasion as an original, distinct, particular affection in human nature.

According to Dr. Cogun, in his "Treatise on the Passion", compasion is that infinity of affection, which is excited either by the actual distress of its object, or by some impending calamity which appears inevitable. It is, says this writer, a benevolent arrow at their suffering or approaching misery. The etymology of the word expresses this idea with strict propriety, as it signifies "founding with the object." Compasion is always connected with a disposition to relieve, and will always prompt to vigorous exertion, wherever there is a possibility of success; unless some important considerations should render the undertaking improper or unjust. It has no necessary connection with the character of its objects; their difkets being a sufficient excitement. From the great extent and univerality of this affection, it may be justly considered as a generic name, comprehending several other affections which have a more specific application, as mercy, commiseration, pity, &c. Dr. Reid remarks, that it seems to be a holy religion alone that is able to check the tear of compasion. We are told, he says, that in Portugal and Spain, a man condemned to be burned as an obstinate heretic, meets with no compasion, even from the multitude; observing, that they are taught to look upon him as the enemy of God, and doomed to hell fire. But should not this very circumstance, he adds, move compasion? Surely it would, if they were not taught that, in this case, it is a crime to show compasion, or even to feel it. Hobbes of Human Nature, cap. ix. sect. 10. Hutcheson's Enquiry into Moral Good and Evil. Butler's Sermons, fem. v. and vi. Hartley's Observations on Man. Cogan on the Passions. Reid's Essays on the Active Powers of Man, ch. iv.

COMPATIBLE, something that may suit, or confide with another. See INCOMPATIBLE.

COMPENDIUM, an abstract, epitome, or reduction of a large matter into a little compass. See ABSTRACT and EPITOME.

COMPENSATION, an action whereby anything is admitted as an equivalent to another.

Compensation, in the Civil Law, is a kind of right, whereby a debtor pur sued by his creditor, for the payment of a debt, demands that the debt may be compensated with what is owing him by the creditor. Compensation is equivalent to payment, and answers to that which is called Serifer in common law.

Compensation-Balance, in Horology, is the balance of a chronometer, so ingeniously contrived, that two opposite actions counteract each other's natural effects at all times upon it, and equalize its momentum under all the changes of temperature experienced in different climates and seasons. The opposition of two natural effects, produced by an artificial arrangement of the acting parts, is very properly called the compensation, which has been effect ed in various ways. The most simple compensation that has been produced in a machine for measuring time, is that which depends upon the variable fluidity of the oil applied to the pivot holes of the balance arbor, and of the other arbors of a watch; oil, it is well known, however good, is more fluid in hot weather than in cold, and therefore diminishes the friction at the pivots more in summer than in winter, the consequence of which variation in the friction of a watch with the ordinary crown-wheel escapement, would have its rate accelerated in the former season, and retarded in the latter, by this simple cause, if there were no compensating property in the structure of some part of the mechanism; this property naturally exists in the balance and balance-spring, both which are subject to have their dimensions enlarged by heat, and contracted by cold; and these changes alternately occasion retardations and accelerations in the rate of going; but in such a way, that when the watch is dispersed to have its rate accelerated by the more fluid state of the oil, it is also dispersed to have the same retarded by the contemporary enlargement of the balance and balance-spring; hence the quantity that one of those dispositions prevails over the other in any watch, when regulated to mean time at a mean temperature, constitutes its liability to vary its rate of going in different months of the year. Berthoud, who attempted to proportion the thickness of his pivots to the oil with a given balance, so as to produce an approximation towards a good compensation, has called this the natural compensation, which is a very proper appellation, as it exists in a certain degree in all chronometers and watches that have oil applied to them. This natural compensation, however, is found to be a very imperfect one, and unfortunately interferes with the effects produced by the better compensations, which, in opposition to this, may be called the artificial compensations. To banish the interference of the variable effects produced by oil, is one of the difficulties, and indeed now the principal one, that opposes the efforts of the chronometer-maker, to make the action of his mechanism permanent, uniform by the most fluid state of the oil, which is also nearly agreeable to the order of time in which they were invented.

Compensations at the Spring.

1. Harrison's Compensation Curb.—We have said, under our article CHRONOMETER, that Mr. James Harrison of Barton, in Lincolnshire, was the first person who applied a self-compensating piece of mechanism to the balance of a watch, which contrivance, according to his provincial dialect, he called a curb, and which we have taken the liberty to name a curb. Fig. 1. of Plate XXVIII. of Horology, represents the balance, balance-spring, small cock, and curb, as they would be seen by an eye placed directly over the back of the pillar-plate, when the large cock is taken off, that bears the verge-pivot; AA is the plate on which the mechanism is placed; B the balance of a uniform metal; C the spiral spring of regulation; DE the thermometrical curb, so contrived as to lengthen the effective length of the spring in the different degrees of temperature, without manual adjustment; G a double cock to which the curb DE is attached; and F the small cock, or pin, to which the exterior end of the spring is pinned. The thermometrical curb, DE, is composed of two long slender slips, one of brats and the other of steel, pinned

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pinned together in different places, and is attached to the smallest half g of the double cock G, so that it may be brought nearer to G, or removed farther from it, as pleasure, before e is fixed to G, in order to place it at the requisite point between a and b of the spiral; the double cock is revolved in the figure as though it were fixed by a cork and freely pin to the plate B, but in the original time-keeper, it was adjustable between two parallel pieces, that allowed it to approach the fluid T, or recede from it, for the purpose of ascertaining particularly the height length of the curb, for effecting the requisite compensation: the side of the curb next to D was steel, and the side next to E brass, and the effect produced by changes of temperature was that: when the time-keeper was exposed to heat, the balance, and balance spring, had their dimensions altered, so that the momentum of the balance was increased, supposing its arc of vibration unaltered, and the force of the spring diminished, or at least would have been considerably diminished by its elongation, if the curb had not been applied; and the natural consequence would have been for the piece to retort; but the same heat, which naturally produces these changes in the balance and balance spring, produces such a change in the shape of the curb, as counteracts these natural effects; in the cafe of heat, the brass part, E, of the curb becomes more lengthened than the steel part D, by reason of its greater expansion, and a consequence is, that the original side of the piece D E, becomes convex on the brass side E, and concave on the steel side D; that is, the remote or free end of the curb, considered as an index, moves from a towards b, and as this end carries two pins between which the straight end of the spring passes, these pins, and not the steel, form the limit of length at all times of the regulating spring, which consequently is curved as to its effective length, under all the variety of elongations, that it experiences from different degrees of heat; so that it may be said to be always both lengthening and shortening in nearly the same proportion: on the contrary, when the piece is exposed to cold, or to speak more scientifically, is exposed to a low temperature, the steel side D, becomes convex, and the brass side E, concave from its greater contraction, and the free end of the curb moves from b towards a, thereby mechanically lengthening the spring, as it naturally contracts, in a degree sufficient to check the velocity which the balance would acquire from its diminished dimensions. Thus, whether it is summer or winter, in hot or in cold climates, the compensation of the curb is calculated to counterbalance the natural effects of changes of temperature on the dimensions of the balance, and of its regulating spring.

It has been ascertained, that the elasticity of the balance-spring is affected by changes of temperature; but we conceive it to be its force, or that power which depends on its length that is naturally altered, and not, at least in any sensible degree, that property which depends upon its temper. This contrivance, we have said, in another place, laid the foundation of modern chronometry, though it was afterwards found to be a better application of the compound bar, that the balance itself should bear it, in order that the dimensions of the balance and of the compensation pieces might be affected in a contemporary manner by the variation of atmospheric temperature, so that the artificial changes going on in the balance itself might compensate the changes naturally produced in it and in the spring, instead of the artificial changes in the spring being made to compensate the natural changes in its dimensions, and in those of the balance.

We have before said, that this mechanism was invented and used so long ago as the year 1726, and that it is incapable of the usual adjustment for rate, except at the fixed fluid, from which the fastening pin must necessarily be taken, to admit of the spring's being lengthened or shortened.

**Compensation by F. Berthoud.**

In the year 1752, which was about seven years before the Board of Longitude published the principles of Harrison's Time-keeper, Mr. F. Berthoud, the famous clock and watch-maker of Paris, contrived and introduced, into No. 1, of his marine clocks, a compensation curb, acting on the spiral spring of the balance in a manner similar to the action of Harrison's curb, except that the backward and forward motion of his *pince spiral*, or curb, was produced by the difference of two direct expansions according to the disposition of the grid-iron pendulum, which Harrison had previously invented, (for the description of which see the section, "Alodynamical clock, by Mr. Reid of Edinburgh," under the article Clock.) The mechanism by Berthoud, is represented in fig. 2. of Plate XVIII, the eye being, as before supposed, to be directly over the pillar plate of the frame; the circle AA denotes the plate just mentioned; B B, the grid-iron frame, attached to the end-plate, and composed of alternate bars of steel and brass, joined together by end-pieces like the compensation-pendulum alluded to, which therefore need not be again minutely described; the pair of brass bars in the middle of the frame, or grid-iron, are those which act by protruding more or less in different degrees of heat against the tail-piece D, of the double cork DE, movable on an arm with pivots borne by the plate and cock G, or by G made as a double cock; H is the principal cock, in which the balance pivot runs in the triangular hole, made by three friction-rollers, not shown in the figure; the *pince spiral* b, and arm a are fast to an arm which is pivoted into the cock H, and a small cork under it, which is attached to it; this arm is parallel to the balance verge, and is so contiguous to it, as to be in one of the eccentric points, from which the spiral of the spring which it holds is geometrically described; that is, at half the distance from the verge, that the two nearest spirals are from each other; on each of these two levers, a and b, is a sliding piece of metal; that on a for the lever E to roll against, and that on b to have a fit for receiving the thread of the spiral spring; they are both fixed by piercing holes to their respective levers, when adjusted to their proper places thereon, but b is prolonged to d, which is attached to the graduated L piece by the screw e, and this L piece has a pointer, used as an index for the graduations on the bridge I, that lies across the grid-iron frame, when attached to the plate AA. K is a spring, pressing against a tail-piece of the lever e to keep it always in contact with the lever E; G is the spiral regulating spring, as in an ordinary watch, and F an adjustable fluid, for the exterior end of the spring, with an oblong perforation for the pressing screw; the interior end of the spring being fast to a collet on the verge, which is adjustable by friction. The mechanical action is thus produced; the difference of the expansibilities of the steel and brass rods of the grid-iron frame becomes sensible at the pin D, in the tail-piece of the bent lever DE, movable in a point of bridge G, between those two letters; the part E, being longer from the centre of motion than the part D, which is acted on, moves faster and carries before it the lever a, and together with it the *pince spiral* b, and L piece with the screw e; and it is obvious, that, as the sliding piece, borne by lever a, limits its effective length from its place of contact with lever F, the relative lengths of these two levers may be varied at pleasure by adjustment, till the effect produced...
The Application of Harrison's Curb to a common Watch.

After Berthoud had made the alterations, which we have just described, in Harrison's curb, he turned his mind towards simplifying it so as to become useful in a common watch; the manner in which he succeeded in doing this is shown in fig. 4 of our present plate, where it will appear by inspection how the action takes place, particularly as we have placed the same letters of reference to the same parts, as in fig. 3; the difference of the two contrivances consists chiefly in the fluid, F, being here fixed half to the circular plate of the frame, in the curb-lever being bent and having its centre of motion on a separate small bridge, H, and in the opposing spring, K, being attached to the face of the plate itself; otherwise the adjustment for temperature is performed as in fig. 3, and is equally capable of taking in the extreme limits of temperature. (For another disposition somewhat similar to the present one, see Berthoud's "Supplement au Traité des Horloges Marins." Plate III. fig. 8.)

Compensation by Mr. Alexander Cumming.

Mr. Cumming published his book on "The Elements of Clock and Watch-work," in the year 1766, in which he has given an ingenious though complex method of compensating the effects of heat and cold on the balance and balance-spring, different from the foregoing ones, and depending on the difference of the direct expansions of two separate and different metals, added, like Berthoud's, by the introduction of adjustable levers; whether the invention preceded or followed Berthoud's gridiron frame and lever, is a consideration which does not, perhaps, affect either of their two claims to originality, as Harrison's curb was most probably heard of, if not previously known, by both the mechanisms in question; nor does it appear that either of the two complicate methods here spoken of has been copied by others in practice. Fig. 1. of Plate XXX. of Horology, represents a view of Cumming's mechanism of compensation, without the balance, as viewed by the eye placed directly above it, when fixed to the back of the pillar-plate of the frame. The outermost circular rim, A A , is of steel, and has eleven small rollers revolving on as many pins or studs inserted into the plane of the rim, and the interior rim, B B B , which rides against the rollers, is of brass, but is not an entire circle; one end of this interior, or brass, rim, is screwed fast to the plane of the steel rim, by means of a spirally grooved extremity, placed upon the plane of the steel rim, as shown in the figure; in this situation it is clear that the excess of the brass rim's expansibility will make its opposite ends approach each other in a high temperature, and recede in a low one, while the friction-rollers will prevent jerks; hence any object opposed to the free end of the brass rim will be pushed forwards by it, as the temperature is raised, which effect affords the means of alternately lengthening and shortening the spiral spring of the balance in the following manner; the free end of the brass rim presses against the end, a, of a lever moveable on a stud about the middle of it, and the oblong slit made in the opposite end of the same lever receives a pin inserted into the contiguous end of a second lever, b, moveable about its remote end round a socket concentric with the balance-vertex, or nearly so; the lever, b, which may be called the curb-lever, has two pins in underneath, not seen in the drawing, between which the outermost thread of the spiral spring passes; hence it is plain, from an inspection of the figure, that when the end, a, of the flat lever is pushed forwards, its opposite end draws towards the pin of the curb-lever, and with it the curb, so as to shorten the effective length of the
the spring in this case; and on the contrary, when the brafs
rim shortens by a low temperature, the contrary effect takes
place: for the end, d, of the flite lever follows the free end
of the said rim as it retires in contracting, in confequence of
a spring, not seen, impelling it into contact with this end at
tall times; the ratio of the two actuating ends of the two levers
from their respective centres of motion is adjusted by the
horizontal axis, g, squared at the end to receive a key; for as the
interior end of this axis is formed into a flite which paffes
into a tapped hole in a square nut on which is the centre of
motion of the flite lever; the said square nut is made to flide
in an oblong hole of the plate below the lever; and thus the
different parts of the flite may be made, successively, to
impel the pin of the curb-lever, as the compensation may be
found on trial to require. The balance, of course, is
placed above this mechanism, and vibrates free from it. We
observe that in the original drawing given by Cunnings,
(fig. of his Plate XIV.) the spiral is made to turn the wrong
way about, so that the effect of heat will be to elongate the
spring, which contradiction would double the natural effect
of variations of temperature instead of compensating them,
as the contrivance is intended to do, and would do, if rightly
conducted; but we see no reason to doubt this being as
effectual and permanent as any of the foregoing modes of
producing a compensation, when the spiral is bent the right
way round, as we have placed it.

Berthoud's Compensation by a Brafs Arch.

Another method of producing a compensation, different
from any of the preceding ones, in its mode of application,
comes next under our consideration, as another production
of the French clock and watch maker, whose name we have
had frequent occasion to mention with respect.

Fig. 5, of Plate XXVIII. exhibits the plan of all the
effential parts of this contrivance, in an intelligible manner;
A, as usual, is the principal cock over the pillar plate; B,
the balance of the metal; C, the spiral spring; D, an
arch of brafs with its ends refitting in two flapping notches
filed into the steel bar, E, which is fixed by a screw, near E,
in the middle, to the plate, so that it may be at liberty to
yield both ways to the action of increased or diminished
temperature on its total length; F, is, as before, the flit
to hold the exterior end of the spring, while the interior
one is left to a collet on the balance-verse; G, is a flite lever,
with a pin in its short end, g, and its long end pointed
as an index, to reach to the dividers, H, made on the
plane of the plate, which bears the mechanism; the effect
is thus produced; the brafs arch, D, is more elongated than
the straight steel bar, E, with the less increase of heat;
this arch carries a small screw, the head of which is just op-
posite the pin, g, already mentioned, between which screw
and pin the outermost coil of the spiral spring paffes; now
if the screw and pin were made to approach till they both
should touch the spring at opposite fides, they would be-
come in place of a curb, and there limit the length of the
spring that comes into action; on the contrary, if they were
made to move from each other as the spring tended up to the
flit, F, placed on the plate, they would be too narrow; but
when they are placed at such an intermediate distance
from each other that the screw limits the opening of the
spiral, and the pin its closing, before the part of the spring
near the flit is moved by the motion of the balance, then
the natural effective length of the spring is contrived, and
the pin and screw together become a species of curb, that
limits the effective length of the spring from an indif-
fini-ted point, lying somewhere between the flit and the
said pin and screw; which indifferen-tiate point will always
be nearer to the flit the more the pin and screw are removed
from each other, and vice versa; hence it is easy to see,
that moving the index, G, forwards or backwards, on the
graduated portion of a circle, H, will bring the pin, g,
next to, or remove it farther from, the screw head, than a
mean distance, and will thence affect the rate depending
on the effective length of the spiral spring, with a given ba-
ance, maintaining power, and eafement; but it is the
same thing if the index be suffered to remain, and the screw
be brought nearer to the pin; for the one limits the right
hand and the other the left hand excursion of the balance;
this is the precise operation of the contrivance; the superior
elongation of the brafs arch over the feel bar shortens the
radius of curvature of the arch, and makes the screw-head
approach the spring, more or less, according to the change
of temperature, to which the acting parts are exposed.
The law by which the approach is effected is somewhat dif-
ferent, however, from that by which an expansion-rim is
guided, with one of its ends at liberty; and the manner also
in which the effective length of the spring is limited, allows
a long scale of lengths, in a corresponding fhort scale of
differences between the screw head and pin; the latter
of which laws is evidently disadvantageous to the nicety of the
adjournment for temperature; besides, when the brafs arch
and the feel bar are found on trial not to be in their due propor-
tions to each other, the remedy cannot be applied with-
out varying the original proportions, by lengthening or
shortening the verfed line, as the cafe may be, which altera-
tion will require the mechanism to be displaced.

Improvement on the left Compensation.

Berthoud, having discovered the inconvenience and ob-
jections to the last described compensation curb, proposes
another in his " Haloire du Temps," tom. ii. p. 101 and 102,
thus: A, fig. 6, Plate XXVIII., is the principal cock,
mounted as usual on the pillar plate behind; B is again the
balance of one metal; C, the usual spiral spring; D, b, a
rack moveable on a focket concentric with the balance verge,
with some additional apparatus carried by it; E is a second
cock; and F a third, bearing the pin, or sliding flit, with its
frame and securing spring as in fig. 3 of the fame plate
already described; G is a pinion with an arbor squared at
the projecting end, to receive a key, which pinion has its
teeth formed fuitable to impel the teeth of the rack D d;
a and b are two coin pound bars of brafs and steel, lattice-
ted together with hard focder, inferted at d into a bearing piece,
and kept fay by a prifing screw e, urging them together
with the loofe piece, d, interposed, and kept parallel by a
clamping piece f; the rack has a circular perforated groove,
which allows it to pass backwards and forward by the ac-
tion of the pinion, while the heads of the two fcrews, f and g,
confine it to the fame plane on the back of the plate; and
fally, the compound bars, a and b, have each a pin at their
free extremities, which contain between them the left coil of
the spiral spring, the action of which is limited precisely
in the manner described in our last compensation mecha-
nism; here, however, the law of limitation in the effective
length of the spring is different; the latter, as we have seen,
depends on the quantum of play between the pins, whereas,
in the former, there was no play at all, and the curb itself
was the limit; seeing the effective length of the spring di-
minishes as the pins approach each other, the exterior la-
ments of the compound bars, a and b, must necessarily be
brafs, and the interior ones fteel, to shorten the spring in
high temperatures, and the contrary; when the effect pro-
duced is too great, the clamping piece, f, is carried outwards
towards the pins, in order to shorten the bars, which have
their lengths measured from this clamp; but when the ef-
feet produced is too little, the said clamp must be brought
inwards towards $d$ to lengthen the bars; so that the scale
of adjustments here runs along the length of the two paral-
lel compound bars, as it relates to the variations of tem-
perature; while the adjustment for a mean rate is made by the
index $b$, which showed the quantum on the contiguous por-
tion of a divided circle. Still, we think, that while a small
variation in the play, between the curving pins, produces a
large variation in the effective length of the spring; this
contrivance can have no pretensions to rank in utility with
some of the more recent inventions, that place the compen-
sating parts on the balance itself.

Compensation by Breguet.

A compensation similar in effect to the two foregoing
ones by Berthoud, but more simple than the latter, is the
which Breguet of Paris has applied with success to his
common watches; this compensation is shown in fig. 7 of Plate
XXVIII. where the bounding circles denote the back plate of
the frame; $A$ the principal cock; $B$ the balance of one
metal; $C$ the common spiral spring; $D$ the a three
armed piece, called by the French a rateau, to which is
attached the mechanism of compensation thus: the curv-
ilinear fork, $a$, is composed of two metals: each prong con-
fined to a slip of steel and a slip of brass, so attached together,
that the fork is the exterior, and the brasses the interior part in
each; the end $a$ is screwed to the lever $D$, and the end $b$
loose, consequently at liberty to approach or recede from
the spiral spring, as the changes of temperature affect the
fork; the interior end, $a$, of the fork bears a pin near the
letter $b$, not seen by reason of the lever $D$, which lies over
it, and a second pin similar to the other is carried by the
lever $D$, between the two largest coils of the spiral; these
two pins limit the effective length of the spring exactly in
the way that the two preceding compensating contrivances
have been explained to do, for which reason we do not re-
peat what we have already said on this part of the subject;
the alternate inward and outward motions of the pin, $b$, re-
gulate the distance between the two pins, on which the play
depends, and consequently the length of the spring also, as
it has regard to the action; the prong $a$ has a tendency to
become slanting by heat, in consequence of the concave
part being brass, but the prong, $b$, has a tendency to be-
come still more convex in consequence of the brasses being the
convex part; the joint effect of which alterations of shape
and position will be, that, as the balance and its spring be-
come enlarged, the space between the curving pins will be-
come diminished, and the contrary. The watch is regu-
lated for mean time by the index part $d$ of the three-armed
rateau, and the third arm, $e$, contains a pin about the middle
of the spiral spring, which we conceive to be the banking
pin, though no mention is made of it in the original de-
scription. "Histoire de la Meure du Temps, by Berthoud."

Compensation by Mr. James Scott.

In May of the year 1805, Mr. James Scott, of Graffton Street,
Dublin, published an account in Mr. Nicholson's Journal, (vol.
XI. p. 19—21, 8vo. series) of a compensation curb which acts in a manner somewhat analogous to that which we have
described as the invention of Cumming; but it is evident
he had not previously seen the one alluded to, nor yet Ber-
thoud's, otherwise he would not have laid in his letter to
Mr. Nicholson, that "artsists have not been able to invent a
compensation curb adjustable to the exact expansion re-
quired." The contrivance now before us is ingenious, and
we presume might be applied to an ordinary watch with con-
"Compensation.

Compensations
Compensation.

Compensation on the Balance.—Thermometer of Peter le Roy.

We have said under our article Chronometer, that Harrison was the first person who suggested the idea of the balance carrying its own compensation, and Peter le Roy was the first who in 1766 succeeded in such a construction; in our notice of this invention, however, there is a typographical omission which we beg leave to correct here before we proceed to our description; it is said under the article just referred to, that the compensation was effected by means of two thermometers, one of mercury and the other of alcohol, attached to, and borne by the balance itself; instead of one or each bearing mercury, and the other end alcohol, &c., as will now be more clearly understood.

Figs. 1 and 2 of Plate XIX. of Horology, exhibit so much of the balance of Peter le Roy as is necessary for explaining its construction; A Δ, in fig. 1, is a portion of the arm or verge to which the balance B is attached by screws; C is a small ring attached to the inferior part of the verge which holds the two screws of regulation for mean time, and which also clamps the horizontal parts of the two glass thermometrical bent tubes, D and Ε, placed diametrically opposite to each other, one of which is seen in a detached plate in fig. 2; these tubes are also held fast by two other clamps, to the middle of the verge, as may be seen in fig. 1; the superior end of the straight vertical part of each tube is open to admit the pressure of the atmosphere on the mercury, which is now seen standing at the same level in both the upper portions of each thermometer, after the inferior or horizontal connecting part is filled; but the bulbs and parts above the tubes Δ D and Ε, are filled at a mean temperature with alcohol, respectively resting on the columns of mercury:

when the balance and balance-pring are enlarged by heat, the alcohol has also its bulk increased, and descends below the letters D and Ε, for instance, in very high temperatures as low as the horizontal connecting part, in which case the mercury pressed upon it descends under the alcohol, but ascends in the same proportion at the other end, till it reaches nearly the open superior end of the vertical straight part of the tubes respectively; the mercury which was before in a column parallel to the verge, but at a distance from it, is now also parallel but contiguous, and as it is a ponderous fluid, the momentum of the balance is considerably diminished by the approach of the mercury to the centre of motion, which change of position of the mercury constitutes the compensation required to balance the effect of an enlargement of the balance itself, and of an elongation of its regulating spring taken jointly: in a low temperature the contrary change takes place in the situation of the mercury, for as the bulk of the alcohol contracts and retires round the acute angular part into the bulb, the exterior vertical branch becomes filled by the mercury. Peter le Roy, we have before said, was disposed to prefer this balance to the balances he made entirely of metal, but the fragility of the bent tubes, and the liability of the fluids to be agitated, if not to be mixed, sometimes constituted objections to its portability, that prevented its being copied by other chronometer makers. The adjustment for the extremes of temperature must have been made by varying the quantity of mercury in a given tube; and probably tubes of various dimensions were tried successively before the exact effect was produced, both at the extremes, and at all the intermediate degrees of temperature. The balance being heavy, was furnished by a thread above the superior end, A, and the slender cylindrical part, underneath the same A, rotated in a triangular hole, made by three surrounding friction rollers, not shown in our figure; lastly, two regulating springs, wound in contrary directions, were placed under the ring, C, near the lower pivot of the verge, which springs are purposely left out, that the reader may not have to view more parts than are necessary for explaining the compensation balance itself.

Compound metallic Balance of P. le Roy.

Peter le Roy, however, was not content with trying his thermometrical tubes, only to effect a compensation on the balance; but he so far adopted Harrison’s idea on the requisite construction of a balance, carrying its own compensation in motion, that he tried moreover his compound bars of steel and brasses, not, indeed, as curbs, applied to the springs according to Harrison’s method, but as rings to the balance itself; fig. 2 of Plate XXIX. shows a balance of this contrivance, where A is the diametrical bar fixed to the verge, and BB and CC two separate semicircular portions of the compound rim, which were each composed of laminae of steel and brasses respectively riveted together in different places, in such a way that the brasses were the exterior or convex ones, and the steel pieces the interior or convex ones; the loads are not given in the drawing, but the inventor says “Memoire sur la meilleure manière, &c.” that his contrivance made a considerable portion of the circumference to approach the centre of the balance in a high temperature; so that either it must have had loads on the ends of the semicircular parts of the rim, or otherwise these parts themselves must have been thick, which would prevent their due obedience to the variations of temperature. Fig. 4 is a kind of register contrived to examine the law by which the flexure of a compound bar was guided, as compared with a mercurial thermometer, thus: A is the croffes and rim of a balance of one metal, steel, we will suppose, and the compound plate B, were set at the end of the plane of the rim, has its end, C, at liberty to obey the changes of temperature; near b is a small cock into which a roller, bearing the index C, is pivoted above, against which roller the free end, b, of the compound bar, B, acts, whilst the interior end of the index points at the divisions made on the portion of a circle, D, near the centre of the balance: the experiments that were made with this instrument, according to P. le Roy’s account, showed that the rim of the index, in circumstances, corresponded very well with the rim of a mercurial thermometer, in all the different parts of the scale; and if this was found to be really the case, we cannot help thinking it extraordinary that the contriver of the compound metallic balance, which has flexibility and portability to recommend it, did not prefer it, in actual practice, to the mercurial balance, which was liable to the objections we have stated.

Arnold’s Balance.

Some pains have been taken to prove that Mr. Arnold, senior, did not invent his compensation balances himself, but borrowed them from Peter le Roy; we confess that we have not met with any conclusive argument in favour of such a supposition, but, on the contrary, have ascertained under our article Chronometer, that, “a variety of different shapes were given by Arnold to his balances, and actually tried in practice, before he adopted the one in present use, some of which balances are yet in existence;” and we have it now in our power to say further, that many of the balances here alluded to are yet in use, as ourselves have witnessed very lately; which balances have been proved to be excellent regulators, and some of which have public testimonies in their favour. We propose therefore now to describe them in succession, or at least such of them as have fallen in our way.
No. 1. In his preface to his printed certificates, Mr. Arnold, senior, says, that his first attempt to improve clocks and watches commenced in the year 1704; but we find it was not till the year 1715 that he turned his mind seriously to the construction of chronometers; the first compensation balance that he actually brought into use, was the one represented in fig. 5 of Plate XXIX, which was taken from one of the original balances while in our possession. The rim is 2.4 inches in diameter, and is, together with the three radial arms, of slender brass; the compensation bar is of brass and steel coiled round the balance verge, at a little distance from the mechanism which lies between it and the plane of the balance; the exterior part of this compound spiral bar is brass, and the interior part steel; a b is a piece of steel moveable round a tube surrounding the balance verge, and having a longitudinal aperture or slit, each way from the centre to nearly each extremity, a and b respectively; the end, a, is turned up a little, and has the exterior end of the compound spiral bar of compensation attached to it, so as to partake of its motion under all the changes of temperature; c d and e d are two bracket pieces of metal carrying each a pin under them, that exactly fit the longitudinal slit of the piece, a b; consequently these bracket pieces also partake of the motion produced by the compound spiral bar; the ends, c and e, of the bracket pieces are attached to h balance rums at the points, e and c, by the flat leaf metal springs, c c and e e, respectively; to the ends d d, of the load brackets are attached the long pins, d f and d f, which pass through the small leafy bridges on the rim, and carry the fettoral loads of temperature, f and f; the action produced on this mechanism by the changes of temperature may be thus explained: when the temperature is elevated, the exterior end of the compensation spiral bar, moves in a direction from a towards c, and carries with it the end, a, of the cross-piece, a b, at the same time the opposite end of this piece moves from b towards e which is contiguous to it; the opposite motions of the ends, a and b, of the cross-piece carry the two brackets in such direction that the loads of temperature, f and f, are both made to approach the balance, so as to effect its movement when in motion; which is the effect required in the above-named temperature; on the contrary, when the temperature is diminished, the motion of the load brackets is only objectionable; in this case, the ends d and d move towards d and d respectively, and the loads of temperature are thrown outwards, to increase the momentum of the moving balance. The quantity of effect is regulated by enlarging or diminishing the loads, f and f, of temperature, as compared with the fettors, c and c, or weights of adjustment for mean time; or otherwise, by screwing them into a new situation, cut or in, as the case may be; the springs, e e and e e, do not interfere with the inward and outward motions of the loads of temperature, but only confine the brackets to the plane of their action, and limit the direction of their motion. This compensation-balance was applied to ten or twelve different chronometers, between the years 1775 and 1778, but we have not been able to ascertain its comparative merit; its principle is simple, in that there is but one compound bar, to move two loads of temperature, but its mechanism is complex, which was probably the principal reason why it came into disuse.

No. 2. The next balance, which Mr. Arnold contrived, was that which is represented in fig. 6, of Plate XXIX, in which the mechanism is much more simple than in its predecessor; the rim and diametrical bar, by which it is attached to the verge-collet, are both steel, the parallel bars, a b and a b, are composed of brass and steel respectively, the brass being here interior and the steel exterior, and are inserted into pivot holes made in the rim of the balance; in some of the chronometers, the end, b, was fast to the balance, and the end, a, of the same bar loose, while the end, a, of the other bar was fast, and the end, b, of the same was loose, but in other chronometers both the ends of each bar were formed into pivots with flounders, and were inserted loosely by bending the bars about the middle; the cross pieces, c and e, which carry the loads of temperature, are of steel, and the rim itself is so notched as to admit of the loads being contiguous, that they may meet with very little resistance from the air, when in motion; the mode of action is obvious from a view of the figure, and from what has been previously said of a straight compound bar, being liable to become convex on the brass side by an elevated temperature, and the reverse in an opposite temperature; the bars, a b and a b, becoming convex, with increased heat, towards the centre of the balance, draw the loads, d and d, nearer to the rim, and when the balance is straight at a mean temperature, and, on the contrary, as the heat diminishes, the same parallel bars become convex on the sides next the rim, and carry the loads from the balance; and these alternations of motion, keeping pace with the changes made in the dimension of the balance, and of the balance-spring, constitute the compensation for the effects of temperature: the exact quantity of effect is adjusted as before, by altering the magnitude of the loads, d and d, as compared with the weights of the adjustment-screws, c and c, for mean time; or otherwise have their relative positions altered in regard to their distances from the centre. About twenty of these balances were made and applied as regulators, all of which performed their office, we are told, very well; the famous gold chronometer, No. 36, tried for 18 months by Dr. Markelyne, at the Royal Observatory, while worn in the pocket, under the different degrees of temperature, agitations of the body, and changes of position, had, and still has, one of these balances; and its rate, which has been published, established its credit to so high a pitch, that it was sold for 1000 l. or guineas, notwithstanding the detent of its escapement, after the fashion adopted by the French, is fixed to an arbor revolving on pivots. The balances of the present construction were made from the year 1779 to the year 1783, on the years 1775 and 1776, no objections were heard against them, for they were the play they necessarily had to allow for the difference in the temperature, which we think might have been scarcely perceptible when the pivots were well made and fitted tight into their holes.

No. 3. The object of the motion at the pivot holes in the later balance, (No. 2.) was attempted to be remedied by the construction exhibited in fig. 7, of the same plate, where the expansion pieces are of brass and steel, arranged in the form of a long S, which form was afterwards adopted by Emery, the Swiss watch-maker, who settled in London, and who has been the reputed inventor of this arrangement; the two halves of the S are joined at the middle, and the brasses, as before, are interior throughout; the rim and diametrical bar of steel, in the balance we examined, which was 1.2 inches only in diameter, by reason of its having been used in a pocket-chronometer; the exterior end, a, of the S is attached to one of the shortened crooks of the balance, and the interior end of the same bears the long pins, c and c, which carry the loads of compensation d and d; the long pins, c and c, do not pass through the rim, but are held to their proper positions by the two fettors, e e and e e, as in No. 1, or fig. 5; as before, the relative weights of the loads of compensation, d and d, and f f, the loads of adjustment for mean time, constitute the limit of effect to be produced by the expansion bars, sup
fopple their distances from the centre fixed; but if the
loads remain unaltered, the effect to be produced may be
adjusted by varying the distances of the screws respectively
as they regard the centre of the balance. Of these balances
about forty were made and applied to use between the
years 1779 and 1782, and have been found to perform
well.

No. 4. The length of the S pieces in the last balance
having been found difficult to execute of uniform thickness
and shape, by reason of their great length, the construc-
tion represented by fig. 8, was substituted, which is very nearly
similar to its predecessor, and indeed differs from it only as
the bends are united by an interposed piece of solid metal,
thereby dividing what was before one half of the S, into
two parallel compound bars; in all other respects, the
description just given of No. 3, together with the letters of
reference, will equally apply to our present balance; which
circumstance renders a further detail superfluous.

Of these balances not more than six or eight were con-
structed, by reason of the more simple form, which is now
in general use, having been adopted in 1782, when a patent
was taken out for it. The specification, however, contains
the drawings of Nos. 2 and 3 (figs. 6 and 7), as well as of
the common balance, which we have fully described under
our article Chronometer, to which the reader is respectfully
referred, and which was known to the workmen by the
name of the Z balance, by way of distinction from the S
balance. Besides the above-described constructions of the
compensation balance, Arnold, we are assured, contrived va-
rious others which never came into use, one of which had
the expansion pieces parallel to the verge of the balance, and
borne by it; and others had platinum in the expansion pieces,
instead of itself; but we conceive it to be unnecessary to
pursue the subject of his inventions further, than merely to
observe, that so regular a succession of different balances
actually made and used, where so many were constructed,
and where each was evidently meant to be an improvement
on the last preceding, may be taken, if not as a positive, at
least as a presumptive proof, that the imputation of plagia-
rum, unless otherwise fairly made out against him, is in
contradiction to the facts we have here adduced; which are
all facts open to still further investigation.

For the description of the compensation balance as made
by the Brockbanks and Earnshaw, the reader is directed to
the recent article Chronometer, where this part of our
present article has been anticipated. The description of
Earnshaw's balance and deception, however, which we have
quoted as the production of this chronometer maker, it may
be proper to note, was not his, but the production of Mr.
Firminger, the late assistant of Dr. Massey on at the Royal
Observatory, as we have been assured by the author himself,
since the publication of the pamphlet in which it appeared
obviously as Mr. Earnshaw's own account. And now that
we are on the subject of Mr. Earnshaw's balance and de-
ception, we beg leave to add further here, an acknow-
ledgment of our misinformation respecting the patent, which
we were credibly informed, and said, was never taken out;
but which we now find, on more minute examination, was
actually taken out and registered. How far his pretensions
to originality of invention are warranted by his construction,
is not the object of our present enquiry.

A Compensation balance by F. Berthoud.

Berthoud informs us, "Hilt. de la Mefure, &c." p. 104
of his memoirs, that he had proposed a means of compensation by
the balance itself, so long ago as in the year 1754; but that
it was not until 1787 that he effect ed his purpose. The
reader is led to suppose, that he was not indebted to P. le
Roy, or any other maker, for the contrivance, but that it
was the result of his own inventive genius; and that the
contrivance was his own is rendered somewhat probable
from this consideration, that in his "Traité des Horologes
Marines," two balls only were proposed to be used with
two compound bars; but after a calculation of the effect to
be produced, contained in page 195 of the Supplement, four
balls were found to be necessary with as many compensating
bars. The proposed arrangement is shewn in fig. 9 of
plate XXIX, and is certainly original; A, A, A, and B
are their radial bars of metal attached to the verge collet of
the balance by two screws, as seen in the figure; the flender
bars, a, a, a, and a, attached respectively to the exterior
ends of the four radial bars by screws and fixing pieces, are
four compound bars of steel and brass, the exterior lamelle
being of brass; and each of those compound bars has at its
free end a lint formed into a screw, upon each of which a
ball, B, with a long socket, is fixed towards or from the
verge, to adjust the momentum to the maintaining power,
and regulating spring, and also to effect the equilibrium,
when the machine is brought to time. From what we have
repeatedly said of the fixture of a compound bar, it is easy
to see, that the brasses portions being exterior, will cause
the balls to approach the centre of motion in hot weather, and
the reverse in cold; which effect constitutes the compensa-
tion. The author acknowledges that the exact effect to be
produced depends on the relative length and thickness of
each compound bar, and that many trials are necessary to
come at the due proportion; consequently, the want of an
adjustment for temperature, after the balance is tried, is in
this contrivance a fundamental objection to its general
adoption; otherwise we see no reason to doubt its accuracy
of performance.

This balance was used in No. 8 of Berthoud's marine
pieces.

Another Compensation balance by F. Berthoud.

The compensation balance which we have just described
being found liable to objection, the same author contrived
and used, in his No. 63, a different arrangement of the
compensation bars, which he again reduced to two, and
introduced two additional screws for adjustment of mean time,
placed at right angles to the former; the contrivance is
shown in perspective in fig. 10 of Plate XXIX., where all
the essential parts may be viewed at once; A A is the bal-
ance, made light and of the best brass, having four cylinders;
B and D are the compensation bars fixed to the rim of the
balance at one end, and bearing the screws or weights of
temperature, C and D, at the other respective; and D
and D are the screws or weights of adjustment for mean
time, borne by two of the opposite cylinders, as shewn di-
rectly in the figure. The balance as usual is attached to
the verge collet by a couple of small screws; the exterior
lamelle of the compound bars, B and D, are of brass,
and the interior ones of steel, so that a high temperature
brings them towards the centre of motion, as the balance it-
self balances, and as its spring elongates and becomes weaker.

The adjustment for temperature may be made in two ways:
either by altering the relative sizes of the screws of tem-
perature and screws of mean time; or otherwise, which is
more readily done, by screwing one pair in and the other
out, so as to produce a similar effect without taking either
of the pairs entirely out; it is hardly necessary to explain
that, in all the constructions, when the momentum of the
balance confits more of the moving weights of temperature,
than of the moving weights of mean time, the effect of the
compensation
Compensation bars will be the greater in the same proportion, and the contrary; but, however, the quantity of flexure of the compound bars in the present balance remains unaltered, and consequently the velocity of inward and outward motion is not capable of adjustment in any other way, than by altering the ratio of their length to their thickness respectively, which may be called an alteration rather than an adjustment.

Compensation balance by Jaffet Emery.

We have said, under our article Chronometer, that Emery's balance is one of the varieties previously constructed by the senior Arnold, (see his No. 3.) and the reader will now judge for himself how far our allusion was founded in fact. We take our drawing from Berthoud's figure of Emery's balance, which Saracen took over into France, and which was much admired for the accuracy and permanency of its regulation. Fig. 11 of Plate XXIX., presents the plane of Emery's balance to the eye placed over it; A A is the balance made with four croffes, the rim of which is brass; B B is a steel flat ring screwed to two of the croffes; C and D are the two compensation bars, each bent twice over into the shape of a long narrow S; D and E are the weights for mean time, formed into adjusting screws to fuit the female frets of the protuberances made on the plane of the balance; the screws, E and D, are the adjustable weights for temperature, but are tapped only at the parts nearest their heads; the points being fast to the exterior ends of the compound bars, and the intermediate pins being without threads and moving freely in the two lockets respectively fixed to the rims, or rather formed out of them in the solid; the S pieces have the brass laminate as usual on the exterior sides, so that at the middle of the S of each compound bar, the position begins to be reversed, in order that the condition may be fulfilled; the interior end of each compound bar presses against the circumference of the fleec ring B B, which we have said is fast to two of the croffes; consequently, whenever a change takes place in the temperature of the parts, the whole motion takes place at the foot of the screw of temperature, at each opposite side of the balance. The small interior circle F is the upper end of the cylindrical spring of temperature, together with the pin that holds one end of it, and the part that forms the banking, which have nothing to do with the compensation. In this balance, as in Berthoud's latter one, the adjustment for temperature must necessarily be made, by altering the rotation of the moments of the weights of mean time, and of the screws of temperature.

Mr. W. Hardy's Compensation-balance.

Among the most recent improvements in chronometry, may justly be reckoned the new compensation-balance of Mr. W. Hardy of Clerkenwell, communicated to the Society of Arts in the Adelphi, in March 1855, and renumerated with thirty guineas. The balance in common use, that brings the weights of temperature alternately towards and from the verge, by simple fixure of the compound rings, is objectionable, in the opinion of Mr. Hardy and others, on account of these considerations: 1st, The two metals of the compound pieces of the rim, when united by fusion of the bars, are liable to partial separations, which affect the permanency of the adjustment for temperature; adly, The variation of the centripetal force of the weights of temperature in large and small area of vibration overpower the elaticity of the expansion pieces, and affect the momentum of the balance, as adjusted for mean area of vibration; the weights being thrown from the centre more in the long arcs than in the short ones; and, zndly, The adjustments for rate and temperature, however carefully made, will affect the equilibrium of the balance, and the rate of the machine placed in different positions, without subsequent rectifications; to remove these objections, Mr. Hardy has availed himself of the direct expansion of two different metals, where their difference of expansion produces a mechanical action on the loads of temperature, such as is suitable for general introduction in practice.

Fig. 3. of Plate XXX. of Horology, exhibits a lateral view of the balance before us, and fig. 4. the balance inverted; A A is the balance bar or verge of the ordinary construction; B B is a fleec diametrical bar, borne by the collet of the verge, 1.6 in. long, 0.234 broad, and 0.031 thick; this fleec bar is made uniformly except at the two extremities, which are made narrow, and in each of which a notch is cut in the inferior surface, so far, that the remaining thin metal constitutes a fitting above each notch; between these springs, which we have said form a part of each end of the diametrical bar of the balance, are attached two fleec at right angles, so as to be parallel to the verge when the small springs are not acted on by any force; the upper parts of the fleec, in the original drawing, are formed into fers with threads adapted to the tapped holes of the two balls C, C, which they support, and which are weights of adjustment for temperature, but in our more recent drawing, the weights slide and are fixed by side fers; D, I, are two similar fers for rate which screw respectively into the inferior or thicker parts of the fleec, so as to be capable of increasing or diminishing the effective momentum of the balance according to circumstances; and E, E, are fers of adjustment for equilibrium; each end of the fleec diametrical bar has, moreover, a fluid or shoulder, pointing downwards under the item just described, which fluid cannot be seen in the figure in a separate plate; underneath the fleec bar, and exactly parallel to it and to each other, are placed two bars of brass, shorter but broader than the fleec bar; the length of each is 1.47", the breadth 0.078, and the thickness 0.032, like that of the fleec; each of the two brass bars has one of its ends secured to one of the fluids described, and profiling with its opposite end against the other, but in such a way, that their positions are reverted with respect to the fixing of the ends; the fixed end of the one being contiguous to the free end of the other reciprocally; a second view is given of these bars in fig. 4., where they are represented in an inverted plate. The action of the mechanism it is not difficult to understand, though the author has rendered his account somewhat confused by his mention of short levers, which the reader does not see in the figure. When the balance is exposed to heat, the fleec bar elongates a little both ways from the verge in the centre, but the two brass bars separately elongate more, and consequently each detached end, having liberty to move a quantity equal to the difference of the two expansions, pushes against the fluid or shoulder that is contiguous, and forces it outwards; the slender fers parts, above the notches of the fleec bars, now yield to the forces impressed respectively on the fluids, and the parts of the two fers which yield may be considered as centres of motion of a pair of levers; the distance from the yielding point of each spring to the point urged by the detached end of its brass bar, may be called the length of the short end of each lever, and the distance from the said point of each spring to the centre of the load carried by the nearest item, may be taken as the length of the long end of the lever, which two ends suppose as 1 to 20 respectively; then if the difference
of the expansions of the steel and one of the brass bars be called 1 outwards, the quantity of inward motion in the same denomination will be 20; consequently, the same heat which compresses the steel bar, and carries the bars from the centre of motion, will, at the same time, by the excess of expansibility of the brass bars, bring the same bars inwards towards the same centre, and the two contrary actions may be adjusted, by moving the loads up or down their proper limit, till the opposite effects exactly balance one another; for as those inbalances that have been mentioned of the shock ends of the levers are variable in length, or very nearly so, varying the longer end on a, viz., the difference of the arc, from the middle parts of the bars, considered as centres of motion, will alter the ratio, which may be done in the requisite proportion, till the compensation is found in the tentative adjustments to be perfect. When once the exact compensation is effected, it is evident, that the law by which it is preferred is uniform and constant, as that according to which the gridiron pendulum is constructed, which experience has proved to be permanently useful in practice. When the balance has its momentum properly adjusted for rate, with a given maintaining power, escape, and balance-spring, and when the balance is put into an exact state of equilibrium, the items being at all times either exactly parallel to the verge, or, if inclined a little by the extremes of temperature, alike inclined, it is self-evident, that, under these restrictions, the adjustment of the loads up or down for temperature will not destroy the adjustments of rate, and of equilibrium for the positions, previously made, provided the two loads be of equal weight, and placed in similar positions on their respective items; and even if one happen to be a little higher on the item than the other, no sensible bad effect will be produced thereby, which circumstance is one of the greatest recommendations of the present balance. The effects produced by variations of temperature, are said to be produced not by jerks, but regularly, notwithstanding the united structure of the parts is sufficiently firm; and, lastly, the construction is so simple, that a common workman may succeed in making and putting together the constituent parts of this balance without difficulty.

Compensation on the Balance and also at the Spring.

Double Compensation by Berthoud.—F. Berthoud having experienced much inconvenience, and lost much time in making the adjustments of his balances for rate, temperature, and position, at length determined to avail himself of the curb, as a supplemental aid, in addition to the compensation carried by the balance itself; the union of the two modes of effecting the due compensation, is represented in fig. 3 of Plate XXX. of Horology, in such a way that all the acting parts may be seen and understood: A is the balance-rod or brass, and bears four croffes, besides two projecting bars, B, B; these bars carry each a compound or compensation bar, C, of the usual construction, the free ends of which are perforated and attached to the crofles or loads of temperature, D and D, or, more properly speaking, to the sliding sockets on those loads screw in and out, in making the adjustment; E and E are the crofles or loads of adjustment for mean time: F is the cock, and G a small cock, bearing a jewel mounted on it, to take the pivot of the balance. The action of the compensation bars, C and C, needs no explanation, after what we have said about the effect of such pieces borne by other balances: I, is the compensation bar of the curb for the spiral spring, shown in the figure, and acts on the bent steel bar, K, which holds the cutting pins, and which has its centre of motion

under the cock, at a short distance from the balance-verse: the quantity of action of I on K is regulated by the holding piece, a, sliding in a dove-tailed groove, between the parallel bars, b and b, screwed to the piece N, which piece, N, is movable round a pin under it, near the part, a, in such a way as to admit of a little circular motion, together with the compound bar, I, to regulate for mean time without altering the length of I; and a flow motion may be given to the piece, N, by the graduated piece, M, which is movable on the pivots of its arbor, in the plate and small cock, L, with the tooth, or rounded part, lies in a converging part of the end of N, and imparts it almost imperceptibly as the end, M, moves; the graduations of the piece, M, are seen through a hole made in the interior case of the watch; and the adjustment for rate may be made there without trouble, and without altering the previous adjustments of the balance itself; but then, if there is an isochronal point in the acting length of the spiral spring, the adjustment made by means of the curb will correct for isochronism, which will become sensible as the arc of vibration varies in use; otherwise the adjustment for temperature might be completed by varying the length of the compound-bars, I, after this adjustment has been nearly effected on the balance itself, and after the balance has been brought into a state of equilibrium for the positions; but whether the effect produced by the joint agency of two causes, will be uniform in all degrees of temperature, has not been fabled by the author.

Compensation for the Spring's want of Isochronism.

That property of a balance’s regulating spring, which makes the balance perform all its vibrations, long, short, and intermediate, precisely in the same time, is called its isochronal or isochronous property, from the two Greek words, 

iso, equal, and chronos, time: it has been ascertained that there is a certain proportion between the length and thickness of the spring, of whatever shape; this doctrine has been maintained by Dr. Hooke and Peter le Roy separately, and has been subcribed to by Arnold the senior, Berthoud, and others, though Perminow of Cambrewey says there are different points in the same spring equally isochronal; now allowing that there is only one point in the length of every spring that determines its isochronism, and that consequently all other lengths of the uniform spring regulate the balance uniformly, only while the arc of vibration remains unchanged, to determine the isochronal effective length of such spring would be to render all compensations, for want of isochronism, unnecessary, and this point may in most springs be ascertained by repeated trials with long and short arcs successively, and by marking down the respective results; for it is found from experiments, that, if shortening the regulating spring makes the long arcs of vibration be performed in less time than the short ones, and vice versa, the spring under trial is capable of having its total length reduced gradually till the isochronal length is determined, but, generally speaking, not otherwise. Another method of managing the spring, which may be said to be effecting a species of compensation for want of isochronism, in the total length of an uniform spring, is tapering it from the outer to the inner end, till, with a given length, the long and short arcs are performed in equal times; this method was strongly recommended by Cumming in his Essay towards the improvement of watch-work, and after him, Earnshaw has laid much stress on this particular, so much indeed, that he considers his skill in the adjustment of
of the ifochronism, by a tapering spring, as constituting one of his chief claims to public encouragement; nay, he professes to manage the business so nicely, that he can make such a slight deviation from perfect ifochronism as will compensate the Hillary also, in the intensity of his springs in use!

The first notice that we have of a regular compensation, for want of perfect ifochronism in a regulating spring, is Harrison's, when he proposed to introduce the cycloidal-pin which we have already confided we do not understand, from the want of shading in the drawing of it, as attached to his compensation curb, in the publication by the Board of Longitude; we may, however, state, that Harrison, not knowing, probably, that there is naturally an ifochronal length in most uniform springs, concluded, that the long arcs are naturally performed in less time than the short ones, reasoning from the circumstance of one of his pieces having been observed to go faster in a horizontal position, than in a vertical one, though the arc of vibration was shorter in the latter than in the former position; he therefore applied his cycloidal-pin, as Mudge did after him, as may be seen in the drawing of his escapement, in such a way that the short vibrations were accelerated by its push more than the long ones, that were not so long acted on by auxiliary means; but the fact is, the use of such a contrivance would necessarily have an effect just opposite to the intended one, if the balance-spring happened to be pinned to the stud at the contrary side of the ifochronal point; that is, if the long vibrations were slower than the short ones, the cycloidal contrivance would make the difference still more feltible.

Berthoud's Compensation for want of Ifochronism.

Berthoud has given an ingenious method of compensating the want of ifochronism in a balance-spring in his "Supplement au Traité des Horloges Marins," which contrivance he calls an ifochronal compensator. (Compensateur Isochron.) The contrivance is represented in fig. 6, of Plate XXX, where A represents the balance with three radii; B an eccentric collet of polished steel, placed on the balance-verse, and pressing against the large roller C, which is carried by and pivoted into a small frame at the end of the flender spring D, attached to the cock, E, on the plate of the watch frame, whenever the long vibrations are found by trial to be performed in a longer time than the short ones, the position of B and C are respectively as in the drawing, at the time when the balance-spring is quickest; for then the pressure of the eccentric piece B, against the roller urged by the spring, is greater in the smaller arcs than in the long ones; but when the long arcs are performed in the least time, the position of B must be at h, and then C will be found by the force of its spring at e, where it is evident, that the pressure will be less in the short arcs than in the long ones comparatively; and the quantity of eccentricity of B must depend on the greatest difference of the two extreme vibrations. The principal reason why Berthoud adopted this ifochronal compensator in five clocks, and in his portable watch for the longitude, was, that whenever the cock was dismounted the ifochronism of his spring, however well adjusted, was generally found to be deranged when re-mounted. The eccentric collet was of course capable of being put to any given eccentricity as well as into any given position for accelerating long or short arcs at pleasure. The English watch-makers have not, that we know of, ever used this contrivance, but depend on their own patience and skill, in ascertaining the best length and most desirable shape of their regulating springs for fulfilling their own purpose.

Mr. W. Hardy's Compensation for want of Iochronism.

Mr. W. Hardy published a short account of a new method of making the balance of a chronometer perform its long and short vibration, in the same time, in Mr. Nichol-son's Journal for September, of the year 1826, (Supple-ment vol. iv. 8vo.) Series which recent, we propose, to copy with some slight verbal deviations, that are more adapted to our figures, as drawn in perspective. The spring a b, fig. 8 of Plate XXX, is screwed to the inferior side of the cock A, fig. 7, and lies over the upper part of the regulating spring, proceeding in a right line to the axis of the balance B, and having a bend to clear the verge, from which it passes on to the end of the spring which it holds. This straight spring is made of such a small strength, that it comes into action before the regulating spring. The other piece c, fig. 8, is attached to the cock, in a line with the flender one, but on the opposite face of the cock; the part of the piece, c, which is bent down, is divided into two parts, and admits the part, B, of the flender spring, to pass and play between its prongs at each side of the prongs is a lateral screw, presenting its point to the spring, in such a way, that the play between the prongs, or rather between the points of the two equidistant screws, may be limited according to circumstances, provided they are not farther asunder than the quantity of the escapement angle. The other end of the cylindrical regulating spring, as usual, is attached to a piece of metal carried by the verge of the balance. The effect produced by the compensating spring, a b, is thus, when the balance is first moved from its place of rest, the flender spring, a b, moves first, till it meets with the point of one of the two serows of the fork, then the cylindrical spring begins to be acted on, as in the chronometers in general; this motion of the stud, at the end of the flender spring, retards the motion of the balance, which begins to be accelerated only, when the stud is at rest; consequently the contrivance before us supposes that the short arcs are in general performed in less time than the long ones; and require on that account, to be checked in their velocity at starting; and the quantity of play in the fork limits the quantity of retardation; but as we have seen the long arcs may be, and often are, performed in less time than the short ones, with springs not adjusted for ifochronism; we conceive, therefore, that, like Harrison's cycloidal pin, which owed its origin to a contrary supposition, the application of the invention we are describing may happen to be productive of an effect, just opposite to that which it is meant to produce; for it can be used as a compensation for want of ifochronism, only in the particular case, when the short arcs of vibration are performed in less time than the long ones, which we have seen is just the opposite application of that adopted by Harrison, and founded, as we have said, on an opposite supposition; whereas the fact is, that sometimes one of the two contrivances may prove to be necessary, and sometimes the other, with a limited length of spring, accordingly as the long, or the short arcs of vibration, may turn out on trial to be performed in the less time; and the trial necessary for ascertaining, whether the spring is too long or too short, will afford the means of ascertaining very nearly, if not quite, the exact ifochronal length, such as shall require no compensation at all; to attain which object, though with some additional trouble, we are disposed to think the preferable practice.
COMPENSATION-Pendulum, is a superior kind of pendulum in which the natural effects of two actions are so opposed to each other, as to counteract or compensate each other’s influence on the motion of the going pendulum. We have already described the grid-iron pendulum invented by J. Harrison, and also Troughton’s new arrangement of the metallic bars, under our article Clock, to which we must here refer; and for the other various constructions of a compensation-pendulum the reader is referred to the word Pendulum, where he will find the subject treated at considerable length.

COMPETORIUM, in the Civil Law, denotes a judicial inquest made by delegates, or commissioners, to find out, and relate the truth of a cause.

COMPETENCE, or COMPETENCY, in Law, the authority, or right of a judge, for taking cognizance of any matter. See Jurisdiction.

COMPETENCY Militaire, Fr. military jurisdiction. In France, the officer of the troops took cognizance of, and pronounced the right of directing the process or proceedings in regard to every thing that concerned military affairs and offences, unless the proceedings were punishable by the provost marshal, and to judge of all crimes and offences committed by an officer against an officer, or by a soldier against a feldar against a civil individual had no concern or interest in it. And if the civil judges were obliged to caufe military persons to be arrested, the commands could demand them, and in case of refusal complain to the sovereign through the minister.

COMPETENT Witness. See Witness.

COMPETENCES, in Church History, an appellation given to the catechumens, when being sufficiently instructed in the Christian religion they required baptism.

COMPÉYRE, in Geography, a town of France, in the department of Aveyron, and district of Millau; one league N. of Millau.

COMPÉHDA, a town of Arabia Felix on the Red Sea, S.E. of Mecca, garrisoned by the Turks.

COMPIONO, a town of Italy, in the duchy of Parma; 12 miles from Ponsremoli.

COMPILATA, Ital. Compilis, Fr. The last prayer or hymn sung in full chorus, at the end of the service of the Roman church.

COMPiegNE (in Latin, Compudium), a handsome town of France, the chief place of a district in the department of Oise, situated on that river at the distance of two kilometres from the confluence of the Oise with the Aisne and 70 kilometres from Paris. N. lat. 49° 25', E. long. 3° 12'. A very extensive forest stretches from this town to the department of the North and that of the Lys. Before the revolution of 1789 the kings of France resided occasionally at the palace of Compiegne to take the diversion of hunting. This palace was built by Charles the Bald, repaired by several of his successors, and reconstructed on a grand scale in 1755 by Louis XV. There is also a beautiful bridge over the Oise which formerly was adorned with the arms of France elegantly carved in stone by Coustou: but this fine monument was mutilated in 1793 by a revolutionary stone-cutter, who put up a cap in its place. Compiegne has a sub-prefept, two courts of justice, and 63,599 inhabitants. The district contains a population of 88,045 individuals, distributed in 165 communes. Its principal trade is in wood, corn, and wool. Its wine is much esteemed. There are but a few manufactures of wove caps and stockings.

COMPITALIA, or COMBITILIA, feasts held among the ancients in honour of the Lares.

The word comes from compitiurn, a crowd-toay; because the feast was held in the meeting of several roads.

The compitalia are more ancient than the building of Rome. Diodorus Siculus, and Pliny, indeed, say that they were instituted by Servius Tullius; but this only signifies, that they were then introduced into Rome.

Notwithstanding what Di in relates, that the compitalia were celebrated a little after the Saturnalia, and that the Roman calendar fixes them on the twelfth of January, it appears that they had not fixed any day at least not till the time of Varro, as is observed by Cæs.ambon.

The feast being then movable, the day whereon it was to be observed, was proclaimed every year. It was ordinarily held on the fourth of the nones of February, i.e. on the second of that month. Macrobius observes that they were held not only in honour of the lares, but also of mania, madness.

The priests who officiated at them were slaves and liberti; and the sacrifices were few. They were re-established, after a long neglect, by Tarrquin the Proud, on occasion of an answer of the oracle, "That they should sacrifice heads for heads," i.e. that for the health and prosperity of each family, children were to be sacrificed: but, Brutus, after expelling the king, in lieu of those barbarous victims, substituted the heads of garlic and poppy; thus satisfying the oracle, which had enjoined capita, beides, at an earl rate.

During the celebration of this feast, each family placed at the door of their house, the statue of the goddess Mania; they also hung up at their doors figures of wool, representing men and women; accompanying them with supplications that the Lares and Mania would be contented with these figures, and spare the people of the house.

As for slaves, in lieu of the figures of men, they offered balls or flaxs of wool. Servius Tullius ordered, that the slaves who affiliated at the compitalia, should be free during the whole time of the feast. Augustus ordered the flaves of the Lares, placed in the crofs ways, to be adorned with flowers twice a year.

COMPLACENCY, in Pathology and Ethics, denotes full and continued satisfaction, connected with a considerable degree of approbation. It has intrinsic value, or some species of worth for its object. Some mental excellencies, or advantages accruing from them; some sentiment, dispositions, and sentiments, approved by others or others with whom we are immediately connected, which, upon close examination, we deem deserving of esteem or applause. Complacency may be enjoyed as the reward of our own conduct, or of the purity and benevolence of our motives; and it may also relate to the approved conduct, sentiments, attainments, and dispositions of others, for whom we are deeply concerned. The satisfaction produced by complacency indicates, that we have, in some respect or other, a personal interest in the object of it; and the approbation implied in it conveys the idea of some kind of excellency. In strict propriety of language, complacency is alone applicable to that species of good which originates from some mental or moral excellency; where there is an indication of property, ingenuity, wisdom, address, or dignity, in sentiment, design, execution, or of rectitude and benevolence in the motive, this affection will profess different degrees of strength, according to the various kinds and degrees of excellency discernible in the existing cause; and high complacency is the most grateful of all the affections. It poises an elevation and a favor peculiar to itself. It is a permanent satisfaction, enjoying the full approbation of reason; and consequently it suffers no alloy from the struggle of contending passions, or opposite desires. When it is in-
spired by our own conduct, it is accompanied by self-approbation, or the testimony of an applauding conscience, enlivened perhaps by the voice of gratitude, and enriched by the eftect of the worthy. If it proceed from the conduct of others, it augments the pleasures of affection, friendship, and gratitude. This affection, however, has its counterpart; and an erroneous opinion of ourselves may change the nature of this sublime affection, and render it the parent of vice and folly. Thus false conceptions of our own talents, acquirements, and conduct, may inspire pride, vanity, haughtiness, and arrogance. Cogan on the Passions, p. 71.

COMPLAINANT, in Law, a plaintiff, or one who prefers a complaint against another, to be relieved by justice or equity.

COMPLEMENT, in a general sense, denotes what is wanting, or necessary to complete some certain quantity or thing.

COMPLEMENT, Arithmetical. See Arithmetical.

COMPLEMENT, in Astronomy, is used for the distance of a star from the zenith; or the arch comprehended between the place of a star above the horizon, and the zenith. It is the same as the complement of the altitude, or co-altitude; or zenith distance.

COMPLEMENT of the course, in Navigation, is the number of points the course wants of 90 degrees, or eight points; viz., of a quarter of the compass.

COMPLEMENTS of the curtain, in Fortification, are those parts of the side of the interior polygon, which form the demi-gorges of the two bastions adjoining the curtain.

COMPLEMENT of the line of defence. See Line of defence.

COMPLEMENT, in Geometry, is what remains of a quadrant of a circle, or of ninety degrees, after any certain arch has been retracted from it. Thus, if an arch or angle be 30 degrees, we say its complement is 60 degrees, since 60 + 30 = 90.

The line of the complement of an arch is called the con- fuse of a tangent, the co-tangent, &c.

We sometimes also say the complement of an angle; meaning so much as it wants of a right angle, or of 90 degrees.

COMPLEMENT, in Heraldry, a term used to signify the full moon, for example, azure, the moon in her complement, and argent the crescent.

COMPLEMENTS of a parallelogram, are the two lesser parallel sides, made by drawing two right lines parallel to each side of a parallelogram, through a given point in the diagonal.

Such are the parallelograms C and M (Plate III. Geometry, fig. 50.) It is demonstrated, that in every parallelogram, the complements C and M are equal: for \( Z + C + \theta = R + M + \tau \); as making up on each side the great triangles, made equal by the diagonal; of which, \( Z = R \), and \( \theta = \tau \) (because the diagonal makes them so); wherefore the remaining parallelogram \( C = M \).

COMPLEMENT of life, in the Doctrine of Life Annuities, denotes the difference, according to M. De Moivre's hypothesis, between the age of any given life, and 86 years; thus, at the age of 50 the complement is 36—at the age of 37 it is 40—at the age of 50 it is 36, and so on. In this hypothesis the probabilities of life through every period of existence, are supposed to decrease in an arithmetical progression, so that out of 86 persons just born, one is supposed to die every year, till at the end of 86 years, which is considered as the utmost limit of humane life, the last survivor becomes extinct. M. De Moivre, who formed this hypothesis with the view of facilitating the computations of life-annuities, derived it from Dr. Halley's "Table of Observations," at Breslaw, which being the only table of the kind at that time, and making the decrements in the middle stages of life nearly equal, so far supported the truth of the hypothesis, and induced M. De Moivre in adopting it. But in the earlier and later periods of life the decrements are so irregular as by no means to accord with this hypothesis; and since subsequent tables, more accurately formed, and deduced from more extensive observations, have been published by Dr. Price, Metfis, Wargentin, Supmilch, and other writers on the subject; and the values also of single and joint lives for all ages have been computed from them; this hypothesis is rendered unecessary, even in cases where it is most correct; in other cases, which involve two or three lives in the quotion, especially if those lives be very young or very old, it gives solutions so inaccurate as to be altogether unfit for use.

By supposing an uniform decrement in the probabilities of life from infancy to extreme old age, the number of years which a person has an equal chance of surviving is made to be the same with the expectation which M. De Moivre by his hypothesis finds to be equal to half the complement of life; that is, if the age be four, the expectation will be \( \frac{86}{2} = 43 \); if the age be 82, the expectation will be \( \frac{86}{2} = 53 \), while the chance that a child aged 4 survives 41 years is \( \frac{2}{3} \), and the chance that a person aged 82 survives 2 years is \( \frac{2}{3} \). Now since each of these fractions is \( \frac{2}{3} \), it follows, agreeable to what has been observed above, that the one has an equal chance of living 41, and the other of living 2 years, or such a number as shall be expressed by their respective expectations. But by the Breslaw table the expectations of those lives are severally 40\(\frac{2}{3}\) and 31\(\frac{3}{4}\) years, while the chance of the younger living 40\(\frac{2}{3}\) years is 0.641, and the chance of the elder living 31\(\frac{3}{4}\) years is 0.53: that is, in the first instance, the chance is less, and in the second greater, than an even one, that the person lives such a number of years as shall be equal to his expectation. This is true in all other tables deduced from real observations, and proves that even in the simplest case the hypothesis is incorrect.

Mr. Thomas Simpson, instead of supposing the complement to be the difference between 86 and the age of the given life, assumed this complement to be equal to twice the expectation when computed from a table of the real probabilities of life, and by this means believed the inaccuracies of those rules which depended entirely on M. De Moivre's hypothesis. But had this excellent mathematician been poissied of the present tables of observation, there is no doubt but that he would have adopted a more genuine method of solution. As far as relates to the computation of the probabilities of survivorship between any given number of lives, M. De Moivre's hypothesis in many cases appears to give approximations which are sufficiently near the truth; but as the mere determination of such probabilities is of no use in computing the values of contingent reversions, inasmuch as the discount of money must be blended in each separate year with the chance of survivorship in that year, the investigation of them is a matter of no consequence, and therefore the hypothesis of an equal decrement, which often leads to great errors in the doctrine of life annuities, may be wholly laid aside without injury or inconvenience in any case. (See Phil. Transactons, vol. 75.)

COMPLEMENT of a Chord, in Music, the note or notes wanting in any chord, to complete its harmony.

COMPLEMENT of an Interval, is the minute quantity it wants in particular temperaments.

COMPLEMENT, is the difference or remainder between an octave or eighth, and any given interval, called also the inversion of that interval, (see Inversion); thus, a
fifth is the complement or inversion of a fourth, and a fourth
of a fifth; a minor third is the complement or inversion of
a major fifth, and vice versa. See Third, Fourth, Fifth.

COMPLETE, in French complet, in Military Language, a
regiment, troop, or company is said to be complete when it
has its full complement of officers, non-commissioned officer,
and privates, separately to the regulations for the time being.

COMPLEMENTS, in Botany, a complete flower, for-
mixed with both calyx and corolla: incomplectus being used
when the latter is deficient, and inchoate when the former.

COMPLEX, a term ordinarily used as synonymous with
compound; though, strictly speaking, there is some differ-
ence between them.

COMPLEX object. See Object.

Complex opposition. See Opposition.

Complex term, or idea, is a term or idea compounded of
several simple or incomplete ones.

Thus, in the proposition, A just God cannot leave crimes
unpunished, the subject of this proposition, viz. a just God,
is a complex term, or stands for a complex idea, composed of
two simple, or incomplete ones, viz. God and just. Mr.
Locke observes, that though the mind be perfectly passive
in the formation of simple ideas, yet it exerts several
actions of its own about them, when once formed: and
that by this means it is, that they become the materials and
foundations out of which all our knowledge is framed.

These acts are chiefly three, viz. 1. The combining of
several simple ideas into one compound one: and thus it is
that all complex ideas are made.

2. The bringing two ideas, whether simple or complex,
together; setting them by each other, and viewing them,
without uniting them into one; by which it gets its ideas of
relation.

3. The separating several ideas from all other ideas that
accompany them in their real existence: and thus all its
general ideas are formed.

As simple ideas are observed to exist in several combina-
tions united together; so the mind may consider them as
united, not only as they are really united in external objects,
but as itself has joined them: ideas thus made up of several
simple ones put together, we call complex; as man, beauty,
army, gratitude, &c.

Complex ideas, however compounded and decompounded,
though their number be infinite, and their variety endless,
may be all reduced under these three heads, viz. modes, sub-
stances, and relations: which see under their proper heads,
Mode, Substance, and Relation. Complex ideas are
often considered as simple and distinct beings, though made
up of several simple ideas; as body, spirit, &c. See Com-
position of ideas.

Complex proposition, in Logic, is that in which the sub-
ject, or predicate, or both, are made up of complex terms:
and if the term added to the subject be essential or necessary
to it, then it is called explicative; otherwise it is determina-
tive, the adjoined term limiting the subject to a particular
part of its extension. Some logical writers ascribe the
complexion of a proposition, in some cases, to the copula,
as in modal propositions: but this rather pertains to the
predicate. See Compound and Modal Proposition.

Complex figure, is that in which the middle term is
not connected with the whole subject, or the whole predi-
cate in two distinct propositions, but is intermingled and
compared with them by parts: e.g. The sun is a fenfeles-
se being, the Persians worshipped the sun, therefore the
Persians worshipped a fenfeless being.

COMPLEXI PART, in Anatomy, a name given by Rio-

lanus, and others, to a muscle called by Albins Iliacer
cervicis, and by some the complexus.

COMPLEXIO, COMPLEXUS, in Metaphysics, the union,
or coalition of several things different from each other;
either really, or only in our conception. See Complex.

Complexus, in Logic, is a compound word applied to the second
operation of the mind, viz. the judgment; considered as
it affirms or denies anything; such affirmation, &c. necess-
arily importing a combination of several things.

Complexus is sometimes also used by logicians in the sense
of dilemma.

Complexio, in Rhets, &c. is a figure including a re-
petition, and a conversation at the same time; the sentence
both beginning, and ending, with the same word.

Thus Tully: "Quis legem tulit?" Rutius. "Quis ma-
jorem partem populis fuisse privavit?" Rutius. "Quis
cominitis probavit?" Rutius.

COMPLEXION, in Physic, is used for the temperature,
habit, or natural disposition of the body.

Some philosophers distinguish four general and prin-
cipal complexions in man, viz. the sanguine complexion, which,
according to them, answers to the air; having the quali-
ities thereof, as being hot and moist. It takes its name
from sanguis; because the blood is there supposed to be pre-
dominant.

The phlegmatic complexion takes its name from the phlegm,
or phlegm, in which it abounds; and corresponds to water;
being cold and moist.

The bilious, or choleric complexion, takes its name from the
bile, or cholera: it is supposed of the nature of fire, hot and
dry.

Lastly, the melancholic complexion partakes of the nature
of earth, being cold and dry; but this sort of reasoning is
now not much regarded.

Under this article we may introduce a subject that has
occasions much dispute, and considerable difference of
opinion among physiologists. It relates to the variety
of complexion or of colour that has subsisted amongst the
inhabitants of different nations. Some persons, disapprov-
ing the several hypotheses that have been suggested for
explaining this phenomenon, have been led to conceive
that there is a specific difference in the human race, and that
the variations of colour are owing to their not having sprung
from one common original. But this hypothesis contradicts
the most ancient and authentic history extant, which repre-
sents Adam and Eve as the progenitors of all mankind;
and it is also liable to various other objections which we
shall take occasion distinctly to specify in the course of this
work. Dr. Hunter, who has published a thesis on this sub-
ject, has investigated it with particular attention; and he
gives it as his decided opinion, that there is no specific
difference among mankind. In order to guard against the
confusion which has arisen from the use of the term "spe-
cies," he begins with defining it, and he comprehends un-
der the same species all those animals which produce issue
capable of propagating others resembling the original
flock, from which they sprung. According to this sense of
the term, he considers the whole human race as belong-
ing to the same species. But, as in the vegetable creation,
one species of plants includes several varieties depending
upon climate, soil, culture, and similar circumstances that
are incidental, the case is the same with respect to the
human race; the varieties that occur pertain to the same
species, and are produced by the operation of natural causes.
Of the different colours that subsist among mankind, he
enumerates the following, viz.
In tracing the causes of these differences of colour, he sets out with observing that its fect is unquestionably in the skin; that it is confined to the cuticule, consisting of the epidermis and reticulum; and that it chiefly occupies the latter of these. The cuticule, he observes, is much thicker and harder in black than in white people; the reticulum in the latter being a thin mus, is the former a thick mem brane.

The cut of colour in whites he conceives to be transparent, and either totally deprived of vessels or furnished with a very few; the yellow colour appearing in the human cuticule when the cause of the diffuse is removed, which is not the case with a skin in the cuticule from gun-powder, or similar causes. He then mentions three causes, which contribute to destroy the pelliculity of the cuticule, to give it a brown colour, and to thicken it; i.e. access of air, nailes, and the heat of the sun: the effect of these is illustrated by examples; but he apprehends the last to be the most powerful. Admitting such influence of these causes, he supposes it to be sufficient to account for all the diversities of colour, which are observable among mankind. He proceeds to observe, that all the inhabitants of the torrid zone incline more or less to a black colour; and the difference that is perceivable among them may be owing, not to mere heat, but to the other causes also; and if we consider that even in the torrid zone there is a considerable difference of temperature, the existence of a white nation in this climate would not destroy the argument. He is far from opinion, that the existence of a black colour, and of considerable varieties from white, is the nor the innate and collect parts of Europe, may be very easily explained, by ad verting to the manner of life of the inhabitants, who of course are either exposed to the inclemency of the air, or to the constant mists of smoky houses. If, to this reasoning, it should be objected, that infants are subject to these differences even when they are born, and previously to the influence of the causes above mentioned, Dr. Hunter replies, that many peculiarities acquired by parents are transmitted to their posterity; in proof of which, he refers to hereditary defects, which will continue to infect families for many generations. Thus, a parent exposed to causes that destroy the natural whiteness of his complexion, will beget swarthy children; and the same causes continuing to operate upon the son, the blackness will be increased. In this manner, all the different shades may have been at first induced, and afterwards continued. To this objection, however, it might be anwered, that the fact is not admissible; as it is now generally allowed, that the children of the blackest negroes are born white.

Mr. Clarkton, in a dissertation introduced in his "Effay on the Commerce and Slavery of the Human Species," has considered and well illustrated the subject of complexion. In the investigation of this subject, the first question that occurs relates to the precise tint of the colour. As the old anatomists commonly divided the skin into two parts or lamina, viz. the cuticule and cutis or true skin, they must have supposed, that as the latter is the fame in all the varieties of mankind, however different their external hue, the fact of colour must have existed in the cuticule or upper surface. Malpighi, however, discovered that the skin is divided into three lamina; viz. the cuticule, the true skin, and a kind of coagulated substance situated between both, which he denominated the "rete mucosum." Accordingly, this discovery served to ascertain the point in question; for it afterwards appeared, that the cuticule, separated from the other lamina, was semi-transparent; and that the cuticule of the blackest negro was of the same transparency and colour with that of the purest white; and as the true skins of both were invariably the same, the rete mucosum must be the fact of colour. That this is the fact has been also determined by a variety of anatomical experiments and physiological observations. The causes, therefore, that operate in producing difference of colour, must affect it by acting on the rete mucosum, which, from the numberless perforations of the cuticule, is no less accessible than the cuticule itself. These causes are probably those various qualities of things which, combined with the influence of the sun, contribute to form what is called "climate." Moreover, it is a further confirmation of this hypothesis, that the mucous substance before-mentioned is subject to variation, according to the difference of climates from the equator to the poles. Thus, the inhabitants of many kingdoms and islands of Asia are found to have their rete mucosum black; those of Africa, situated near the line, are of the same colour; those of the maritime parts of the same continent, are of a dusky brown, nearly approaching to it; and the colour becomes lighter or darker, in proportion as the distance from the equator is either greater or less. The Europeans are the fairest inhabitants of the world; those situated in the most southern regions of Europe, have in their rete mucosum a tinge of the dark hue of their African neighbours. Admitting these facts, we are led to conclude, that climate has a very considerable influence in occasioning a difference of colour. It has, however, been objected to this reasoning, that people of the same climate, geographically considered, or under the same parallel, are not exactly of the same colour. But to this objection it has been replied, that climate, physically considered, depends upon a variety of accidental circumstances. See Climate.
COMPLEXION.

of the same parallel are not exactly of the same hue, yet they differ only by certain tints of the same colour; and, therefore, if climate has really an influence on the mucous substance of the body, we must expect to find not only a gradation of colour in the inhabitants from the equator to the poles, but also different shades of the same colour in the inhabitants of the same parallel. We might also add another argument of great weight, viz., that when the black inhabitants of Africa are transplanted to colder, or the white inhabitants of Europe to hotter climates, their children, born there respectively, are of a different colour from themselves, that is, lighter in the first, and darker in the second case. To this purpose the able Raynal observes, that the children, which the Africans procreate in America, are not so black as their parents were; and that after each generation, the difference becomes more palpable. It is possible, he adds, that after a numerous succession of generations, the men come from Africa would not be distinguished from those of the country into which they have been transplanted. If we admit the fact above stated, that climate has an influence on the mucous substance, we may reasonably imagine that this variation of the colour of children from that of their parents must take place; for being born white, and not being subject to the influence of causes equally powerful in colder climates, with those to which their parents were subject in the hotter climates from which they were removed, it must follow that the same effect cannot be produced.

On the other hand, we may here allege an important fact, stated by Dr. Mitchell (Phil. Trans. N. 470. § 4.), "The Spaniards," he says, "who have inhabited America, under the torrid zone for any time, are become as dark-coloured as our native Indians of Virginia, of which I myself have been a witness; and were they not to intermarry with Europeans, but lead the same rude and barbarous lives with the Indians, it is very probable that, in a process of many generations, they would become as dark in complexion." Another writer, describing the European settlements on the African coast, observes, that "there are several other small Portuguese settlements, and one of some note at Mitomba, a river in Sierra Leone; the people here called 'Portugueze' are principally born from a mixture of the first Portuguese discoverers with the natives, and now become, in their complexion and woolly quality of their hair, perfect negroes, retaining, however, a smattering of the Portuguese language." Another circumstance might also be mentioned by way of corroborating the argument before us; and this, that the members of the same family, separated from each other, and migrating into different countries, have not only changed their family complexion, but have assumed as many different colours as the different regions of the globe in which they have settled. The Jews furnish a remarkable instance to this purpose. These people, though scattered over the face of the earth, preserve themselves a distinct people, and never intermarry with any out of their own body, so as to have any mixture of blood in their veins, by which they should differ from each other; and yet it is an undoubted fact, that the English Jew is white, the Portuguese swarthy, the Armenian olive, and the Arabian copper-coloured; and there appear to be as many different species of Jews as countries in which they reside. It appears further from the testimony of the most ancient historians, that the darkest black complexion has actually changed in a succession of years into the purest white. Herodotus informs us, that the Colchii were black and that they had cropped hair. These people were a detachment of the Ethiopian army under Scylax, who followed him in his expedition, and settled in that part of the world where Colchian is said to have been situated. Their descendants probably remained in the same country. If this be the case, they must have totally changed their complexion; or the black inhabitants of Colchis must have acquired the hue of the fair Circassian. If indeed they migrated in any one direction from Colchis and to any distance within 1200 miles of Colchis, still they must have changed their colour; for if they had gone in an eastern or western direction, their colour must have been the same as that of the Circassians; if to the north, whiter; and to the south, of a copper colour. Within the above alligned distance of Colchis, there are no black people.

Professor Zimmermann of Brunswick, in his work entitled "The Geographical History of Man," has satisfactorily proved, that the complexion of the human species uniformly corresponds to the degree of heat or cold to which they are habitually exposed. In establishing this position, he differentiates between climates, considered geographically and physically, and thus furnishes an answer to the erroneous reasoning of Lord Kames on this subject. At Senegal, and in places adjacent, the thermometer is often at 112 or 117 degrees in the shade; and here we find the inhabitants jet-black with woolly hair. The heat is equally great in Congo and Loango, and these countries are inhabited by negroes only; whereas in Morocco to the north of these regions, and at the Cape of Good Hope, to the south, the heat is not so intense, nor are the inhabitants of so deep a hue. Lord Kames asks, why are not the Abyssinians and the inhabitants of Zaara as dark a complexion as the Moors on the coast of Guinea? Zimmermann replies, that these countries are much cooler. The defect is not only further from the equator, but the winds blowing over the Atlantic mountains, which, like the Alps, are covered with snow, and the westerly wind coming from the sea, very much mitigate the heat. Nor is Abyssinia so warm, as other Monomotapa or Guinea. The N.E. winds from the side of Persia and Arabia are cooled by their passage over the Red Sea; the northern winds of Egypt lose much of their heat on the chain of mountains that is extended between the countries; the winds from the south and west are sea winds. Thus the only quarter from which they can derive efficaciously heat is from the west, as the air on this side passes over tracts of heated lands. For a similar reason negroes are not found either in Asia or South America, under the equator. These countries, as M. Zimmermann observes, being exposed, from their situation, to sea breezes and cooling winds from the continent. He also observes, in confirmation of this hypothesis, that the mountaineers in warm climates, as in Barbary and Ceylon, are much fairer than the inhabitants of the valleys; that the Saracens and Moors, who conquered the N.E. part of Africa in 1700, from being brown, are become like the negroes near the equator; that the Portuguese, who settled at Senegal in 1449, became blacks; and it is averted by Tudela the Jew, that his countrymen in Abyssinia acquired the dark complexion of the conquered nations.

Upon the whole it may be observed, that colour is a kind of habit of the body, which is gradually acquired, and after a succession of ages, fixed and rendered permanent. Thus, the vague countenance will be perpetual in the highest latitudes of the temperate zone, and, as we descend to the south, we shall find the swarthy, the olive, the tawny, and the black. The uniformity of the effect in the same climate, and on men in a similar state of society, proves the efficacy and the certainty of the cause. As mankind are for ever changing their habitations by conquest or commerce,
merce, we find that, in all climates, they cannot endure the change, but are so affiliated by time, that we cannot say with certainty, whose ancestor was the native of the clime, and whose progenitor was the invading foreigner. For a further illustration and confirmation of the general arguments comprehended in this article, we refer to an "Effay on the Causes of the Variety of Complexion and Figure in the Human Species" by Dr. Smith, professor of moral philosophy in the college of New Jersey. See Neogene.

COMPLEXUS MUSCULUS, in Anatomy, derives its name from the intermixture of tendon with its muscular fibres, which gives to its surface a confused appearance. It arises from the transverse processe of five, six, or seven of the upper dorsal vertebrae, by so many distinct slips; from the transverse processe of the last cervical vertebra; and from the oblique or articulating processe of the fifth, sixth, and seventh vertebrae of the neck. The fasciculi of fibres from these numerous points of origin meet together to form a broad, flat, and strong muscle, which is inserted into the hollow in front of the external transverse ridge of the bone. It sometimes receives a small flabby portion from the spinous processe of one or two of the upper dorsal vertebrae; and is generally connected in some degree with the longissimus dorsi facrolumbalis and transversalis coli. That portion of the muscle, which is towards the spines of the vertebrae, is divided into two flabby portions by an intermediate tendon, and is separable from the rest at its origin; this is described by Albinus, Soemmerring, and others, as a distinct muscle, by the name of biventer cervicis: we follow Cowper, Douglas, and Winslow, in considering this as a part of the complexus, since it is always connected to the rest of the muscle, for two or three inches before its inception.

The action of the complexus consists in carrying the head backwards upon the atlas; and in restoring it to the erect position, when it has been bent forwards. Its longest fibres will also have the same effect on the neck, viz. that of straightening and carrying it backwards.

COMPLINE, in Ecclesiastical Antiquity, denotes that evening, which completed the whole service of the day in religious houses, and began at nine of the clock at night.

COMPLUTENSIAN BIBLE. See Greek Bibles, and Polyglott. The Complutensian edition of the Bible, which the reader will find described and particularly noticed, under the articles to which we have referred, has been highly extolled by Mill and Goetz, and as much depreciated by Wetstein and Semler. Michaelis, in the second edition of his "Introduction," &c. endeavoured to ler it a middle course between the opposite opinions of Mill and Wetstein; though he believed, on the authority of the latter, that the editors, actuated by religious zeal, had materially altered the Greek text from the Vulgate. But Goetz, he says, in his "Defence of the Complutensian Bible," printed at Hamburgh, in 1761, has enabled him to form a proper judgment of that work; and he acknowledges, that he had too closely adhered to the opinion of Wetstein, after the perusal of the following publications by the same author, &c. "Complete Defence of the Complutensian Greek Text, with a Collection of the principal Differences between the Greek Text, and the Latin Text of that Edition," printed in 1766, and the "Continuation of the Defence of the Complutensian Greek Testament," &c. published in 1769. Michaelis, having since had access to the Complutensian bible in the university library of Gottinges, has particularly used it in the Greek version of Genesis, the Proverbs of Solomon, and the first book of the Maccabees; and in these books he has found its reading as pure, and as little altered from the Latin, as Goetz had described them. It has been questioned what were the MSS. from which this edition was prepared, and whether the editors had any besides those which were sent to them from Rome; the silence of the editors is no proof of the contrary, for they make no mention of the Codex Rhodensis, which had been presented to Cardinal Ximenes, though Stunica, in his controversy with Erasmus, frequently applies it to, as a MS. used in the Complutensian edition; and the Codex Jefferisonianus, which was used in the Septuagint, had been presented to him, by the senate of Venice. Moreover, as the New Testament was begun in 1503, it is wholly incredible that they should have had no other MSS. than those sent from Rome, because Leo X. who communicated these MSS. was not pope before the year 1513, and the subscription at the end of the Revelation bears date January 10, 1514. If, therefore, the MSS. were sent by Leo X., they must have arrived when at least three parts of the Greek Testament were already printed, and yet the editors, at least in the preface, mention no other MSS. One mode, says Marth, in his notes on Michaelis's translation, of solving this difficulty is, to suppose that MSS. were sent from Rome by Julius II. the predecessor of Leo X., and that the writer of the preface to the Complutensian Greek Testament, who knew that the latter was at that time pope, but, perhaps, was ignorant how long he had reigned, committed an anachronism in ascribing to Leo X. what had been done by Julius II. Or, perhaps, he knew that there was no MSS. in the Complutensian edition; and the Codex Rhodensis, had other MSS. of the Greek Testament, which had been procured by the cardinal. But whether they were ancient or modern, of great or little value, it is difficult to determine, as the editors have given no account of them. Wetstein thinks they were modern, because the readings of the Complutensian bible have a remarkable agreement with those of the MSS. written in the 14th, 15th, and 16th centuries; and this opinion is confirmed by the shape of the types, for they are such as we find in the most modern MSS.; and it is probable that the editors had their types cast in imitation of the MSS., which they employed on the occasion. Michaelis, however, in this account of the types, is not quite accurate; for of all the specimens of Greek hand-writing, which Montfaucon has given in his "Palaeographia Graeca," from the first introduction of the small letters down to the 15th century, none resemble the types of the Complutensian edition more than that which is found in MSS. of the 9th century. On the other hand, letters not very unlike the Complutenian are found in MSS. of the 11th, 12th, and even 13th centuries. Moreover, as no MS. written in such letters, as are used for the Complutensian edition, is without accents, and the editors appeal not to the MSS. which they actually used, but...
but to the poems of Callimachus, and the Sibylline prophecies, there is reason to suspect, that their MSS. had accents, and consequently were modern. Accents, however, if it be allowed that the Complutenian edition had them, though it has been generally said (not judiciously) that it is printed without them, afford no proof that a MS. is modern; for they are found in several very ancient MSS. written even with uncial letters, as the Vaticanus, Claromontanus, &c. and perhaps, says Mr. Martin, there are as many ancient MSS. with uncial letters, which have accents as those which have not.

With regard to the main question, whether the MSS. used by the Complutenian editors were ancient and valuable, Mr. Martin candidly acknowledges that he is too little acquainted with the Complutenian Bible to be able to form any judgment; and he therefore contents himself with observing, that Grebich accedes to the opinion of Wetstein and Semler, and says, in the preface to the second volume of his Greek Testament (p. 16): "Complutensia non habuerunt codices Graeci, nulli pauciores, recentiores, exiguis fere, sed hebraicum bonitatem fructus, prout." It has been suggested, that the Complutenian editors, in consequence of a too high opinion of the Vulgate, and a mistaken zeal for the Christian religion, have sometimes introduced into the Greek text readings of the Vulgate, which they did not find in the Greek MSS.

The Greek text of the disputed passage, 1 John, v. 7, in the Complutenian edition, seems to have been a mere translation of one of the editors; because the passage is found not in a single ancient, and in only two modern MSS. the Montfortianus and the Ravianus, the latter of which is only a copy of this edition; and in the former, the text is very different from that in the Complutenian edition. It cannot, therefore, as in the third edition of Erasmus, have been taken from this MS.: though, on the other hand, it is not impossible that they found it in some modern with others, as in the passage, as in the codex Montfortianus, had been already translated. The question can never be decided, because the MSS. which they used are either destroyed, or are at least unknown. For an account of the fate of these MSS. see the article ALCALA. Michaelis candidly explains the conduct of the Complutenian editors so as to remove the charge of dishonesty. They might believe, he says, that this passage was really genuine, and, on account of its supposed importance, take no notice of its alteration from the Greek MSS.; in the same manner as the verse has been inserted by later editors in Luther's version. Or, they might have made some remarks on it, which were afterwards erased by the censors of this edition; for, contrary to their usual custom, they have a marginal note on 1 John, v. 7., which is in itself unimportant, and almost implies that something originally preceded. If they have taken the passage from a modern MS., they have only acted like Erasmus, who has inserted it on the authority of a very modern MS. which he had never seen. In short, many of the best editors have been guided in this passage by a mistaken zeal for the Christian religion, and have acted on principles which they have never admitted in other places. It was the principal object of Goeze to support the authenticity of this passage, and as it occurs in the Complutenian Bible, he defended the antiquity and value of the Greek MS. from which he supposed that passage had been taken. On the other hand, Semler's object was to show the spuriousness of this passage, and at the same time to support the opinion of Wetstein, that the text of the Complutenian Greek Testament, in general, is of little value. The genuineness of this passage is now generally exploded by the most approved biblical critics.

The Complutenian edition is extremely scarce, because only 600 impression were taken off, and it is become too expensive for a private library. That which is now at Gottingen cost 400 florins, and the late Michelken gave an order to his commissari not as far as 1602; and the price of it, says Michaelis, will still increase, in proportion as its great excellence, especially in the Septuagint, shall be better known. Mill, Bengelus, and Wetstein, have collected this edition as a MS with great diligence; but their extracts are by no means complete. Goeze has also given extracts from it, in his "Complete Defence of the Complutenian edition," (p. 277), which, in the proper sense of the word, may be called critical, and which no future editor of the Greek Testament ought to leave unnoticed. Michaelis thinks, that a real service would be rendered to those who are engaged in sacred criticism, if a new edition both of the Greek and Latin Testament was published, that was an exact copy of the Complutenian. From the Greek text of the Complutenian edition were printed the following, viz.: seven at Antwerp in 1564, 1571, 1574, 1599, 1601, 1603; five Geneva editions in 1569, 1619, 1622, 1628, 1632; and, lastly, that of Mavortius, in 1753. These are all described in Le Long Bibl. Sacra, ed. Masch. P. i. p. 191-105. See POLYGLOT.

COMPLUTICA, a town of Spain in the Tarragonensis, placed by Ptolemy in the country of the Callaici, and thought to be the present village of Compludo, in Galicia. It is marked in the chart of M. d'Anville on the right of the Durus, to the south-west of Pallantia.

COMPLUTUM, a town of Spain, in the Tarragonensis, placed by Ptolemy in the country of the Carpetani, and marked in the chart of M. d'Anville in Hispania exterior, N. E. of Mantua; now Acula de Henares, which fe.

COMPOLI, in Geography, a town of Italy, in the kingdom of Naples, and province of Lavoro; 4 miles E. of Sora.

COMPONE, or Gologia, in Heraldry, is composed of two colours in equal divisions in a border, or any other ordinary; if it consists of two ranges it is called counter-compony, and if of three, it is then termed chequy, and is generally used in a border to denote illegitimacy.

COMPOS Minut. See NON-COMPOS.

COMPOSED Effusion. See BASTION.

COMPOSER OF MUSIC, a person who invents a melody, and cloaths it with harmony, according to the established rules of the art. Under the word composition we shall detail the qualifications requisite to support this character. Yet there are insufficient to form a complete composer, whose productions will be felt and admired whenever they are heard. All the science possible, without the inspirations of genius, is unable to command attention, and interest an audience, at all times, and in all places. They are only gifted men that possess such powers. What is meant here by genius, is not a whimsical and capricious imagination, that quots a flowery road to ramble in thicket, through briers and brambles; that render harmony piquant, loads it with discord; and instead of grace and elegance, is labouring to surprise by extraordinary modulation, and to divide the whele scale into half notes; true genius is that latent fire which inflames the composer, irresistibly forces him to write, and incessantly supplies him with new melodies, always agreeable, expressive, and natural, accompanied by a harmony pure, touching, and majestic, which embellishes melody, without overpowering it. "This was the guide," says the Citizen of Genoa, "that led Corelli, Vinci, Perez, Jomelli,
melli, and Durante, to the sanctuary of harmony; and Leo, Pergolesi, Hafl and Buranello, to that of good taste." We have to add to these, Handel, whose sublime works were never heard by Roufeau; the elder Stamitz, Piccini, Sacchini, Cimarosa, and Pacchioni, with Haydn and Mozart, who have gone somewhat further in vocal music, and many leaguers in instrumental.

The knowledge of harmony is doublets the foundation of composition. To fill the chords, prepare and refute dissonances, is the fundamental base; and know all the other little elementary rules, is necessary; but with the rules of harmony alone, we are not nearer being composers, than being orators by knowing the rules of grammar. Padre Martini says, that no one can be a good composer without singing in good taste, and playing well upon the organ. His rules are for a real magister di capella, an ecclesiastical composer; but for secular music he would have said it was necessary to sing and play well on the harpsichord or piano forte. In setting words for the stage, he ought to know what passages are difficult, and what easy to execute; what style suits the finger, and what the character he has to represent; he is to know the compass of voices and instruments, and their peculiar genius and powers; how to produce effects, and when to apply them; to feel the character of different measures; to know all the difficulties and pedantry of the art: imitations, fugues, canons, double counterpoint, and how to write for double, triple, and quadruple choirs. To these add the mysterious laws of modulation; and all this is no more than preparatory to composition. But he must inherently possess a fund of beautiful melodies, sublime harmony, and grand defects.

Besides correct harmony, correct expression, in lyric compositions, is required. The spirit of three several kinds of composition must be called up in writing for the church, the stage, and the chamber. In the first, solemnity and harmony must be invoked; in the second, a distinct style for each character, strongly marked by the poet; ingenious and spirited symphonies, picturesque accompagnements, a judicious mixture of instruments, and their peculiar powers, occasionally called forth; and for the third species of composition, pieces that require but few hands and few voices; free from all tremendous difficulties, in want of no wind instruments; and, unless catches and glises are in question, no provision need be made for more than one or two voices, and a quartet band.

La musica di camera, chamber music, requires care, grace, and elegance, more than force, energy, and feats of execution.

Among the various styles of composition for which an accomplished master should be prepared, is the military, in which wind instruments and drums are chiefly employed. To know the compass, scale, genius, and defects, of the trumpet, horn, clarinet, hautbois and balloon, both in the orchestra and the field, will require some study, counsel and experience.

Roufeau seems sometimes to regard musicians as mere instruments, incapable of reflection; and that it is the businets of philosophers to think for them; so imagine M. Guizard, and all speculative musicians; but in the following advice to a composer, Jean Jaques seems to require more meditation and reflection than the demon of composition, by which a man of genius is poscified, will allow; who, absorbed in his own ideas, or impelled by the ideas of others, flies to his pen or his instrument, without metaphysical reasoning, or analytical inquiry into the foundation of his art. But Roufeau sums up the article Composer (Compofer), in his Dictionary, with the following instruction. "In composing, the author has to consider the physical production of sound, and that its sole use is to delight the ear; or if he moves to invite imaginative music, he has to move the passions by moral effects. In the first instance, he has to select the most pleasing series of sounds, and agreeable harmony; but in the second, he ought to consider music with respect to its similarity with the inflections of the human voice in speech, and the possible conformity between the harmonic combinations of sound and imitable objects." This is all very fine and profound; but we apprehend, that the most happy effusions of genius have been generated without speculative and demiurgic abilities.

For the mechanical rules by which a composer is to steer, we shall refer our readers to the article Counterpoint; where, though its principal rules are dispersed through the work, we shall collect and form them into a Synopsis, and illustrate precepts by examples.

In this musical grammar, we shall perplex the student with no mathematical calculations, no ratios, harmonics, or speculations on the philosophy of sound; but adhere closely to practical knowledge of immediate use in the first stages of study. We shall not even attempt to give new melodies, or harumonal combinations; but endeavour to indicate the foundation on which the best models of composition have hitherto been built. See Counterpoint, Conords, Discords, Harmony, and Modulation.

COMPOSITE, or Composite, in Botany, the twenty-first natural order in the Philosophia Botanica of Linnaeus; and the forty-ninth in the Prelections, published after his death by Gleeke. The plants with compound flowers are kept distinct by most authors, with only a little difference as to the proper limits and most convenient divisions of the order. But Linnaeus does not employ the term, but with the perfectly natural, its essential character is not easily determined. A compound flower, from the obvious meaning of the term, implies the union of several flowers, or florets, as in this case they are usually called, by some common bnd. But this character is not peculiar to the composite plants, nor does it extend to all their genera. For cephalanths, dipacus, feshinis, &c. have several florets included in a common calyx, but belong to a different family; and seriphium, corymbium, and drupae, have only one flower in each calyx, and yet cannot be separated from those which are truly compound. Nor will the united anthers, which Linnaeus has taken for the distinguishing character of his artificial class syngeconia, exactly apply to this natural order; salsines, viola, impatiens, &c. have such anthers, but cannot properly be arranged with the composite.

In the Philosohia Botanica the order stands thus:


All these are retained in the Prelections, except gerbera, which has been abolished, and its tipples referred to ane. Several of them are also placed in different divisions.
The following is the arrangement in the synoptic table annexed to the Prælectiones. Those printed in Italics were added by Linnaeus himself; and those marked with asterisks are additions by Giseke.

are composed by the multiplication of the prime integers, 2, 3, and 5; all primes larger than these, or composite numbers into which such enter, are not musical numbers, but are irrational or rud in a musical sense. See Musical Numbers.

**Composite, or Roman Order, in Architecture.** This name is used to denote a kind of column whose capital is composed of the Ionic and Corinthian forms; the vase or tambour of the capital being that of the Corinthian order, and ornamented in the same manner, with two tiers of leaves, and with a similar abacus; but to these are added Ionic volutes which supply the place of the caulicoli and sactrefus, proper to the Corinthian capital. See the plates of capitals. In other respects, in the shaft base and entablature, there is no uniform and allegiance difference between the Composite and Corinthian, and we shall, in a subsequent portion of this article, examine what claims this composite has to be considered as a distinct order.

The principal remains of antiquity in which the composite capital is found, are the following; the arch of Titus, the arch of Septimius Severus, and the arch of the goldsmiths, the building commonly called the Temple of Bacchus, without the gate of St. Agnes at Rome, the baths of Diocletian, the Baptistery of Conflantine, which is ornamented with porphyry columns of the most exquisite workmanship, removed from some more ancient edifices; the arch at Verona, and the chapel or balister at Nimes.

This capital was therefore very popular among the Roman architects, but it does not by any means appear that they admitted a distinct composite order. A passage of Vitruvius will throw some light upon this point; this author, after describing the capitals of the Doric, Ionic, and Corinthian orders, proceeds to observe, that "there are also other kinds of capitals called by various names, which are distinguished on the same columns, and which have no proper symmetry or relation to any separate order of columns, but they are all derived and transferred from the Corinthian, Pulvinated (Ionic) or Doric orders, from whose symmetries they only differ in the little novelties of the sculptur." In fact, the remains of Roman antiquity furnish a vast variety of capitals, many of which are more remarkable and remote from the usual orders, as well as more beautiful than the composite capital, and yet no architect has ever thought of erecting any of these into a distinct order. The capitals of the Temple of Concord at Rome, a very entire and considerable remain, are composite, being a melange of the Ionic and Doric; but no one has claimed the honours of an order for this strange production.

The difference between the pretended Composite order and the Corinthian, exists merely in the capital; for neither in the remains of antiquity, nor in the works of modern artists, is there any decided, uniform, and characteristic difference in any other particular. But the capital, though an important member, is not of itself sufficient to form an order, otherwise we should reckon not five but hundreds; and a composition which has no appropriate proportions, no exclusive character, can only be regarded as a variety of that order with which it is perpetually liable to be confounded. The equivocal nature of this production has caused great embarrassment to the system-mongers of architecture; for while its later origin would lead them to place it last in their systems, and highest in their buildings, its heaviness of appearance, in comparison with the Corinthian order, seems to indicate a contrary arrangement. It is unnecessary, for the three Grecian orders supply all the expressions which architecture is capable of giving with distinctness. The Doric is strong, the Ionic elegant, and the Corinthian rich; while they admit all the modifications of these qualities that can be required; but as to the Composite, what is it but an exaggeration of the Corinthian, in which the attempt at superior richness has only produced a degree of heaviness.

It has been before observed, that the Romans affected no particular entablature to the composite capital. In the temple of Bacchus the cornice is entirely plain, with a swell friz. The arch of Septimius Severus has a cornice enriched with dentils extremely similar to the Ionic of the temple of Fortuna Virilis, and the theatre of Marcellus; while the cornices of the arch of Titus, and the arch at Verona have both dentils and modillions, and the whole profile of the entablature is precisely in the style of the generality of Corinthian examples. Among the moderns, Palladio has imitated the frontispiece of Nero in his cornice and architrave; but he has omitted its beautiful friz, and substituted a swelled one. Scamozzi's entablature being only one-fifth of the column, and much divided, has rather a trifling appearance, though the details are upon the whole well designed. Vignola's composite has nothing in it remarkable; the architrave differs but little from that of the frontispiece of Nero, and the cornice is nearly the same with that of his Ionic order. Serlio's entablature is extravagantly absurd, being taken from the fourth order of the colonnade, a composition well enough adapted for the termination of that gigantic edifice, but wholly disproportionate to a fingle order.

**Composite Stalk.** See Stalk. **COMPOSITIO MEASUREM, the title of an ancient ordinance for measures, not printed; it is mentioned in the statute of 23 Hen. VIII. cap. 4.**

**COMPOSITION, in a general sense, is the uniting or joining of several different things, so as to form one whole, called a compound.**

The schoolmen distinguish two kinds of composition; the one *initiative*, which is between things of the same nature, e.g. two or more drops of water: the other *essential*, when things of different kinds are joined, and thus constitute new things, or effences, different from any of the parts: and thus say they, from the matter and the form of wood, arises wood; while effence is very different from either of those ingredients taken separately.

**Composition of bodies, in Chemistry.** See Combination and Affinity.

**Composition, in Commerce, a contract between an insolvent debtor and his creditor; whereby the latter agree to accept a part of the debt, in compensation for the whole, and give a general acquittance accordingly.**

**Composition for Trees, in Gardening, a sufflation discovered, prepared, and applied by Mr. Forsyth, for the purpose of removing diseases, defects, and injuries in fruit and forest-trees. It is directed to be composed in the following manner, in his "Treatise on the Management of Trees."**

"Take one bushel of fresh cow-dung, half a bushel of lime-rubbish of old buildings (that from the ceilings of rooms is preferable), half a bushel of wood-ashes, and a sixteenth part of a bushel of pit or riversand; the three last articles are to be sifted fine before they are mixed; then work them well together with a spade, and afterwards with a wooden beater, until the stuff is very smooth, like fine platter used for the ceilings of rooms."

It is advised that the trees should be prepared for its application "by cutting away all the dead, decayed, and injured parts, down to the fresh found wood, leaving the surface of the wood very smooth, and rounding off the edges of the bark with a draw-knife, or other instrument, perfectly
COMPOSITION.

flection, which must be particularly attended to; then lay on the plaster about one eighth of an inch thick all over the part where the wood or bark has been so cut away, filling off the edges as thin as possible; then take a quantity of dry powder of wood ashes mixed with a sixth part of the same quantity of the ashes of burnt bones, put it into a tin box with holes in the top, and shake the powder on the surface of the plaster, till the whole is covered over with it, letting it remain for half an hour to absorb the moisture; then apply more powder, rubbing it on gently with the hand, and repeating the application of the powder till the whole plaster becomes a dry smooth surface."

And he adds the following directions.

"All trees cut down near the ground should have the surface made quite smooth, rounding it off in a small degree as before-mentioned; and the dry powder directed to be used afterwards, should have an equal quantity of powder of aloof mixed with it, in order the better to retilt the dripping of trees and heavy rains."

Such parts or portions of the composition as may be left for a future use "should be kept in a tub or other vessel, and urine of any kind poured on them, so as to cover the surface; otherwise the atmosphere will greatly hurt the efficiency of the application."

And "where lime-rubbish of old buildings cannot be easily got, take pounded chalk, or common lime, after having been draked a month at least."

It is further remarked by the author, that "as the growth of the tree will gradually affect the plaster, by raising up its edges next the bark, care should be taken, when that happens, to rub it over with the finger when occasion may require (which is best done when moistened by rain), that the plaster may be kept whole, to prevent the air and wet from penetrating into the wood."

But "as the best way of using the composition is found, by experience, to be in a liquid state," Mr. Forsyth advises that it should "be reduced to the coarseness of pretty thick paint, by mixing it up with a sufficient quantity of urine and soapsuds, and be laid on with a painter's brush. The powder of wood-ashes and burnt bones is to be applied as before directed, patting it down with the hand."

It is also further advised, that "when trees are become hollow, to scoop out all the rotten, hollow, and dead parts of the trunk to the solid wood, leaving the surface smooth; then to cover the hollow, and every part where the canker has been cut out, or bit in the wood; and as the edges grow, to keep care not to let the new wood come in contact with the dead, part of which it may be sometimes necessary to leave; but to cut out the old dead wood as the new advances, keeping a hollow between them, to allow the new wood room to extend itself, and thereby fill up the cavity, which it will do in time, so as to make it as it were a new tree."

And if the cavity be large, to cut away as much as at one operation as will be sufficient for three years. But in this to "be guided by the size of the wound, and other circumstances. When the new wood, advancing from both sides of the wound, has almost met, to cut off the bark from both the edges, that the solid wood may join, which, if properly managed, it will do, leaving only a flight seam in the bark. If the tree be very much decayed, not to cut away all the dead wood at once, which would weaken the tree too much, if a stand, but endear its being blown down by the wind. It will consequently be necessary to leave part of the dead wood at hle, to strengthen the tree, and to cut it out by degrees as the new wood is formed. If there be any canker, or gum oozing out, the infected parts must be pared off, or cut out with a proper instrument. When the timber is very much decayed and hollow, it will be necessary to open the ground and examine the roots."

Various interesting facts and observations on the advantage and utility of this composition in the removal of the disfigure of different sorts of trees, may be seen below, as taken from Mr. Forsyth's valuable "Treatise on the Culture and Management of Fruit and Forest Trees."

It is stated by Mr. Forsyth as being "the received opinion and common practice of most professional men, to prune or lop their trees, from the month of October, when the juices have been exhausted by the summer foliage, autumnal fruit, and general nourishment of the body of the tree, until the month of March, when the sap or juices, re-invigorated by nature during the winter's repose, begin to re-ascend and perform the annual function of clothing it with fresh foliage, blossoms, and fruit. The reason of this practice is, he says, that the sap being fallen at that season of the year, it has been considered as the most proper period to lop off all superfluous growths, and the efforts of nature to heal the wounds thus necessarily given (before the rising of the sap in the following spring), have been judged best for the safety and health of the tree. The danger of performing this service when the juices are in a more vigorous flow, as in the months of May, June, and July, has been dreaded, from a fear of its occasioning a waste of the nutritive juices, discharging themselves through the wound, to the impoverishment and injury, if not the ruin of the tree."

And it is added, that "the pruning of fruit-trees, and the lopping off large branches from forest-trees during the winter season, has also been frequently attended with great hurt and impediment to their health and vegetation; the wounds being exposed to all the rigours of an inclement season, and thereby contracting those diseases which contain the principles of decay. Hence it is, that such numbers of forest-trees are continually injured in their value for public uses, either by unskillful management, or perverted depredation, or by the violence of boisterous winds, when their limbs and branches being torn off, the trees are left in that unprotected state to imbibe the seeds of decay and rottenness, which will in time pervade their very heart, and render them unfit for any of those valuable purpoises for which nature, by their frame and texture, appears to have designed them. And it may also be observed, that where branches have been cut off from the body of the tree, even at the distance of two or more feet from the trunk, with a view to prevent injury to the timber, even that method has not been found effectual to save the tree from very material detriment; as the remaining limb of the branch so cut away, dying soon after, becomes a ready conduit for conveying pernicious moisture and disease to that part of the tree with which it is connected; and so on, in time, to the whole."

But he supposes "the practice of others in lopping their trees close to the trunk, and drilling the part smooth and even, has left objections than the former; nevertheless, even according to this method, the tree is liable to injury. The effort of nature to heal the wounds thus given, discovers itself by encircling the wound with a kind of callus or lip, which incrusting in size, and swelling out from the annual flow of the juices, forms a hollow or cavity of the central part, where the rain or snow is very apt to lodge; and penetrating between the bark and wood, dried cracked by a hard frost, or a warm sun, promotes that fermentation with the natural juices, which is the certain source of disease and decay." It is suggested that "young, healthful, and vigorous
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Gorous trees, when they have been injured by being wantonly cut through the bark, or from other causes, will sometimes recover themselves, and, to all outward appearance, be restored to their original soundness; but when cut into planks and boards, internal blemishes and faults are discovered in them, which appear to have been occasioned by the early injuries which the tree had received; the texture of the wood not uniting where the wound was originally given; though, from the youthful vigour of nature, the bark has closed, and an external cure has evidently performed on such trees.

The composition is a most efficacious remedy to prevent these evils with all their destruotive consequences, and to restore found timber where the symptoms of decay are already apparent, which being applied in the manner directed, "to the wound or injured part, will infallibly prevent the bleeding of trees, or the oozing of juices through the wounds of limbs or branches that have been cut off in the middle of summer, when they are in their highest vigour, and most rapid flow of vegetation; by which means, any wafeful discharge of the juices is prevented, and they are duly configned to their natural operations of giving nourishment, growth, and fertility, to their respective bodies. By employing this remedy, trees of all kinds, whether in gardens or orchards, in parks or forests, may, he says, with greater safety and advantage he pleased or lopped in the spring, or early in the summer, than in the winter season; as the composition, when properly applied, repels the flow of the juices through the wound, causes a more active vegetation, and affords nature more powerfully in healing the wound at the time the sap is in full vigour, than when it is on the decline, as in autumn and winter seasons."  

The writer considers it also necessary to remark, further, "that both forest and fruit-trees (particularly those which grow in the shade) are very liable to be affected with disorders proceeding from the growth of liverwort, and various kinds of moss, that adhere to the outer bark of the tree, and frequently gain a considerable thickness, that not only prevents the natural flow of the juices, but causes a stagnation in the circulation and brings on decay; which, after destroying the outer bark, penetrates by degrees deeper into the wood. Where this circumstance is observed, care should be taken to clear the whole bark of the tree from these growths; and where it is infected, to scrape or pare it away. When the body of the tree is thus cleansed from infection, the composition may be applied to the bark so cleansed, to close the pores of the wood, when the tree will soon acquire a fresh bark, and improved health and vegetation."  

The author is "confirmed in these opinions by the many experiments and various trials that he has made, to ascertain, by the most positive proofs, the properties of this composition, before he ventured to offer it to the public attention."  "Indeed, every year's experience has increased his conviction of its general utility, when properly applied to the purposes for which it is recommended."  In order to give a more complete illustration of its virtues, and to place the advantages arising from it in a stronger light, he states a few of the very numerous experiments that he has made on the forest trees in his majesty's gardens at Kensington, where the salutary effects of it are extremely evident.

It is remarked that "the first trials of its efficacy were made on some very large and ancient elms, many of which were in a very decayed state, having all their upper parts broken, by high winds, from their trunks, which were withal so hollow and decayed, that a small portion alone of the bark remained alive and sound. Of these trees he cut away at first a part only of the rotten fluff from the hollow of the tree, and then applied the plaster to the place where the operation had been performed, by way of an internal coat. In a short time, however, the efforts of nature, with a renovating flow of the juices, were clearly discernible in their formation of new wood, uniting with feeling as it were from the old, till it became a strong support to that part of the tree where the composition had been applied. He then cut away more of the rotten wood from the inside, applying the plaster in the same manner, with the same good effects, and continued to use the knife in proportion to the acquisition of new wood; so that from the tops of the decayed and naked trunks, items have, he says, actually grown of about thirty feet in height, in the course of five or seven years from the first application of the composition; an incontrovertible proof of its good effects in redefining decayed vegetation in such cases."

And he adds, that "many other elm trees, which, had received hurts from bruises and other causes, and where disease and decay were already evident, after cutting away all the infected part, and duly applying the plaster, were fo completely healed, that the outline of the wound is scarcely discernible on the bark, and the new wood is as perfectly united to the old, as if it had been originally formed with the tree."  

It is stated that "of oak trees also, which had received very considerable damage from various accidents, as blows, bruises, and cutting of deep letter; the robbing off of the bark by the ends of rollers, or wheels of carts, and mutilated branches, a perfect cure has been made, and found timber produced. The acidity, or corrosive quality of the juice of oak-trees, when obstructed in their circulation from any of the causes already mentioned, and fermenting with the wet and moisture imbibed by the wounds from the atmosphere, will bring on disease, and promote decay; for, notwithstanding the hard texture of the oak, when once the principles of decay begin to operate, the acrimonious juices feed the disease, and accelerate its progress, as much, perhaps, as in trees of a softer quality and texture, but when the diseased or injured part is entirely cut away to the fresh sound wood, and the composition properly laid on, as perfect a cure has been made as he has already related in the recovery of elm trees."  

The writer likewise further states, that "various experiments have also been made on other forest trees, as ash, limes, elms, and fycamores, that had received the several injuries to which they are exposed; as well as many of the refuluous kinds, such as the cedar of Lebanon, and others of the pine tribe: in all of which he has experienced a degree of success that exceeded his most sanguine expectations. And as he feels a strong impulse to render his experiments of the most extensive advantage to the community, and in particular to the proprietors of landed estates throughout the kingdom, he begs leave to recommend to their particular attention, that all forest trees, whether felled with a saw or an axe, may be cut near to the ground; at the same time carefully preserving the stump and roots from any further injury. The surface may then be made quite smooth, and the composition be spread over the whole, according to directions already given. But in these cases the composition should have an equal quantity of the powder of asafoetida mixed with the dry powder generally directed to be used; after it is laid on, in order to render the surface harder, and of course better able to refill the bad effects of the dropping of trees, of rain, frost, and snow; an addition which is by no means necessary in the usual application to the stumps of trees."  

He concludes that, "in consequence of this proc-
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cefs, the vigour of the roots will operate so powerfully in the course of the succeeding spring, that a considerable number of buds or branches will shoot forth round the stump, which, with proper care and attention, may be trained to many valuable purposes, either straight or crooked, for fence timber, or other uses; and, by retaining only so many of these shoots as are designed to grow for any particular intention, more than one half will be faced, in point of time, according to the proportions of common growth; for, if a young tree be planted in a fall equal in quality to the state of the old stump, the roots growing from the latter will, in eight or ten years, attain to a size which the single plant will hardly acquire in twice that period. There are also many useful purposes of husbandry, as hop-poles and other poles used on various occasions, for which a number of shoots may be trained from one stump, whose fertile juices will shortly rear a healthy and numerous offspring around it. Very particular attention, however, should, be paid to regulate the number, according to the size and vigour of the stump. It would certainly be proper to leave more of them at first than are intended to be retained for final use, in order to draw up the lap; if too few are left, they will be liable to burst, from the superabundant flow of the juices from the old stock; to prevent which inconvenience they should be cut away by degrees, always supposing the composition as they are cut, and leaving the fresh stem to produce the new tree, and, in time, cover the old stump, and leave nothing but a faint kind of cicatrix at the junction of the old and new part of the tree.'

He thinks it "needless for him to insist on the great advantages which land proprietors and farmers will derive from this method of managing their woods and coppice-grounds, wherever they may be. In many counties of England, coppice, or underwood is an article in very great demand for charcoal, common fuel, or the purposes of particular manufactures, as well as to furnish a variety of articles for husbandry and domestic conveniences." And its advantages in a national as well as ornamental point of view, are still more obvious. See CANKER.

Composition, in Grammar, denotes the joining of two words together: or prefixing a particle to another word, to augment, diminish, or change its signification. See Word, &c.

Composition, in Law, an agreement or contract made between the owner of lands and the parson or vicar, with the consent of the ordinary and the patron, that such lands shall for the future be discharged from payment of tithes, by reason of some land or other real recompense, given to the parson, in lieu and satisfaction thereof. Land may be exempted from the payment of tithes, where compositions have been made; and real compositions for tithes are to be made by the concurrent consent of the parson, patron, and ordinary. Real compositions are distinguished from personal contracts: for a composition called a personal contract is only an agreement between the parson and the patronizers, to pay so much instead of tithes: and though such agreement is confirmed by the ordinary, yet (if the parson be not a party) that does not make it a real composition, because he ought to be a party to the deed of composition. (Mari's Rep. 87.) This kind of composition was permitted by law, because it was supposed that the clergy would be no losers by such composition; since the convent of the ordinary, whose duty it is to take care of the church in general, and of the patron, whose interest it is to protect that particular church, were both made necessary to render the composition effectual; and hence have arisen all such compositions as exist at this day by force of common law. But, experience shewing that even this caution was ineffectual, and the possessions of the church being, by this and other means, every day diminished, the disabling statute 13 Eliz. c. 10, was made, which prevents, among other spiritual persons, all parsons and vicars from making any conveyances of the estates of their churches, other than for three lives or twenty-one years. So that now, by virtue of this statute, no real composition made since the 15th Eliz. is good for any longer term than three lives, or twenty-one years; though made by consent of the patron and ordinary; which has, indeed, effectually demolished this kind of traffic; such compositions being now rarely heard of, unless by authority of parliament. See MODUS.

Composition is sometimes used for "decifio litus." Accordingly compositions were anciently allowed for crimes and offences, even for murder. By this expiation it was proposed to restrain the violence of private revenge. The custom may be traced back to the ancient Germans (see Tacit. de Mor. German. c. 21.) and prevalent in other uncivilized nations. The nature of crimes and offences was estimated by the magistrate, and the sum due to the person offended was ascertained with a minute, and often a whimsical, accuracy. Rothmann, the legislator of the Lombards, who engaged about the middle of the 7th century, discovers his intention both in ascertaining the composition to be paid by the offender, and in increasing its value: it is, says he, that the entity may be extinguished, the perfection may cease, and peace may be restored. About the beginning of the 9th century, Charlemagne struck at the root of the evil, and enacted, "that when any person had been guilty of a crime, or had committed an outrage, he should immediately submit to the penance which the church imposed, and offer to pay the composition which the law preferred, and if the injured person or his kindred should refuse to accept of this, and presume to avenge themselves by force of arms, their lands and properties should be forfeited" Tavernier relates, that in Persia, a murderer is still delivered to the relations of the person whom he has slain, who put him to death with their own hands; and if they refuse a sum of money as a compensation, the sovereign cannot pardon the murderer. Montesq. Sp. of Laws, vol. ii. p. 382. Robertson's Hist. of Ch. V. vol. i. p. 334, &c.

Composition, in Logick, is a method of reasoning, wherein we proceed from a general self-evident truth, to other particular and singular ones.

The method of composition, called also synthesis, is just the reverse of that of resolution, or analysis.

Resolution is the method whereby we ordinarily search after truth; composition, that whereby a truth found, is discovered and demonstrated to others; resolution is the method of investigation; composition, of demonstration.

The method of composition is that used by Euclid, and other geometers; resolution, that used by algebraists and philosophers. The two methods differ, just as the methods of searching a genealogy; which are either by descending from the ancestors to the posterity, or by ascending from the posterity to their ancestors: each have this in common, that their progress is from a thing known, to another unknown.

The method of composition is best observed by the mathematicians: the rules which are, 1. To offer nothing but what is conchted in clear and express terms; and to that end, to begin with definition. 2. To build only on evident and clear principles; to that end, to proceed from axioms or maxims. 3. To prove demonstratively all the conclusions that are drawn hence; and to this purpose, to make use of no arguments or proofs, but definitions already laid down,
axioms already granted, and propositions already proved; which serve as principles to things that follow.

Composition of ideas is an operation of the mind, whereby it combines several of its simple ideas into complex ones.

Under the same operation may likewise be reckoned that of enlarging; whereby we put several ideas together of the same kind, as several units to make a dozen.

In this, as in others, brutes come far short of men; for though they take in and retain several combinations of simple ideas; as possibly, a dog does the shape, smell, and voice of his master; yet these are rather so many distinct marks whereby he knows him, than one complex idea, made out of those simple ones.

An ingenious writer has suggested the impropriety of the phrase "composition of ideas," adopted by Mr. Locke, alleging it is merely a contrivance of language, and that only the composition is in the terms; and that it is as improper to speak of a complex idea, as it would be to call a collection a complex star. He further addts, that they are not ideas, but merely terms, which are general and abstract. Whatever he says, the immortal author of the "Essays under Understanding" has justly concluded in his reasoning on this subject will hold equally true and clear, if we substitute the composition, &c. of terms, wherever he has supposed a composition, &c. of ideas. If upon first examination this should appear to be the case, we shall need no other argument against the composition of ideas: it being exactly similar to that unanswerable one which Mr. Locke himself declares to be sufficient against their being innate. For the supposition is unnecessary: every purpose for which the composition of ideas was imagined being more easily and naturally answered by the composition of terms; whilst at the same time it likewise clears up many difficulties, in which the supposed composition of ideas necessarily involves us. This writer further adds, that it is as easy a matter, upon Mr. Locke's own principles, and a physical consideration of the senses and the mind, to prove the impropriety of the composition of ideas. Locke's Diversions of Purley, pt. i. p. 37, &c.

Composition, in Mathematics, is the taking of a given number of quantities, out of as many equal rows of different quantities, one out of every row, and combining them together. Here no regard is had to their places; and it differs from combination, in which there is but one row of things.

1. "The number of compositions of $n$ things taken out of $n$ rows, each row consisting of $m$ things, is $m^n$, and the $\text{m}^\text{n}$ power of $m$.

Let there be any number of rows, such as $\{a, b, c, d, e\}$, where these things are $a, b, c, d, e$, as $m$ or $m'$.

Then the number of combinations of every 2 is had by joining each quantity in the second row to all the quantities in the first, which will make as many times $m$ as there are things in the second row, or $m$ times $m$, that is $m^2$, for all the two's. Again, taking in the third row, there will be as many times $m^2$, as there are things in the third row, that is, $m$ times $m^2$, or $m^3$, for the composition of three things.

After the same manner, if a fourth row was taken in, all the combinations of every fourth would be $m^4$, and so on: and, therefore, universally, when $n$ rows are taken in, the number of combinations will be $m^n$, which is the number of compositions. Hence it follows, 1. That the number of compositions of all the one's, two's, three's, &c. to $n$, is $\frac{m^n - 1}{m - 1}$. For

\[
\frac{m^1 - 1}{m - 1} = m + m^2 + m^3 + ... = m \frac{m^n - 1}{m - 1}.
\]

And $\frac{m^n - 1}{m - 1} = m^n + m^n + m^n + ... + m^n = m^n$. As will appear by division, or, in general, $m^n = \frac{m^n - 1}{m - 1}$.
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Ans. \(1 \cdot 2 \cdot 3 \times \frac{1}{2} \cdot 3 \cdot 4 \cdot 5 \cdot 6 = 6 \times 60 = 360.\)

E. G. 2. How many compositions are in the form \(a^3 b^3 c^3 ?\) Here \(c = 3, m = 5, t = 2, v = 2, w = 1.\) The index 2 is twice repeated.

\[
\text{Ans.} \quad 1 \cdot 2 \cdot 3 \times \frac{1}{2} \cdot 3 \cdot 4 \cdot 5 \cdot 6 = 3 \times 30 = 90.
\]

E. G. 3. To find the compositions in the form \(a^3 b^3 c^3 d^3 e^3 f^3\). Here \(n = 2, m = 6, t = 3, v = 3, w = 2.\) The index 3 is twice repeated; and the letters \(a, b, c, d, e, f\) thrice.

\[
\text{Ans.} \quad 1 \cdot 2 \cdot 3 \times \frac{1}{2} \cdot 3 \cdot 4 \cdot 5 \cdot 6 = 1 \times 20 = 20.
\]

E. G. 4. To find the number of compositions in the form \(a^3 b^3 c^3 d^3 e^3 f^3 g^3.\) Here \(n = 4, m = 10, t = 3, v = 3, w = 2.\) The index 3 is twice repeated, and also the index 2. The letters \(a, b, c, d, e, f, g\) are thrice repeated; and \(h, i\) thrice.

\[
\text{Ans.} \quad 1 \cdot 2 \cdot 3 \cdot 4 \times \frac{1}{2} \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 = 6 \times 25000 = 150000.
\]

E. G. 5. How many compositions in the form \(a^3 b^3 c^3 d^3 e^3 f^3 g^3 h^3 i^3 j^3 k^3 l^3 m^3 n^3 o^3 p^3 q^3 r^3 s^3 t^3 u^3 v^3 w^3 x^3 y^3 z^3.\) Here \(n = 6, m = 14, t = 5, v = 3, w = 2.\) The index 3 is twice repeated, and the index 1 thrice: the letter \(a\) five times repeated; and \(b, c, d, e, f\) thrice.

\[
\text{Ans.} \quad 1 \cdot 2 \cdot 3 \cdot 4 \cdot 5 \cdot 6 \times \frac{1}{2} \cdot 3 \cdot 4 \cdot 5 \cdot 6 \cdot 7 \cdot 8 \cdot 9 \cdot 10 \cdot 11 \cdot 12 \cdot 14 = 60 \times 201805060 = 12108905600.
\]

So prodigiously do the numbers increase in these operations. See Composition and Composite numbers.

Composition of motion, in Mechanics, is an amalgamation of several directions of motion, resulting from powers acting in different, though not opposite lines.

If a point move or flow according to one and the same direction, whether that motion be equable or not, yet it will still keep the same right line; the celerity alone being changed, i.e., increased or diminished, according to the forces with which it is impelled. If the directions be opposite, as one, e.g., directly downward, the other upward, &c. yet till the line of motion will be the same.

But if the compound motions be not according to the same line of direction, the compound motion will not be according to the line of direction of any of them, but in a different one from them all; and this either straight or crooked, according as the direction or celerities shall require.

If two compound motions be each of them equable, the line of the compound motion will be a straight line; and this, though the motions be neither at right angles one to another, nor equally swift, nor (each to itself) equable; provided that they be but similar; that is, both accelerated and retarded alike.

Thus, if the point \(a\) (Pl. XV. Mechanics, fig. 1.) be impelled equally with two forces; viz. upwards, towards \(b,\) and forwards, towards \(d;\) it is plain, that when it is gone forwards as far as \(a,\) it must of necessity be gone upwards as far as \(e;\) so that the motions both equable, it would always go on in the diagonal \(a e.\)

Nay, suppose the motions unequal as to celerity, fo, vo, gr. as that the body move twice as fast upwards as forwards, &c. yet still it must go on in the diagonal \(a e;\) because the triangles \(a e c, a e c, &c.\) and \(a e d\) will still be similar, being as the motions are; and it will have described the diagonal in the same time which it would have required to describe either of the sides singly.

But, if the motions be dissimilar, then the compound motion must be a curve.

And, if a body, as \(b\) (Fig. 2.) be impelled or drawn by three different forces, in the three different directions \(b, a, \text{and } b d.\) So that it yields to none of them, but continues in equilibrium: then will those three powers or forces be to one another, as three right lines drawn parallel to those lines, expressing the three different directions, and terminated by their mutual concourses.

Let \(b\) represent the force by which the body \(b\) is impelled from \(b\) to \(a;\) then will the same right line \(b e\) represent also the contrary equal force, by which it is impelled from \(b\) to \(e;\) and by what hath been said before, the force \(b e\) is resolvable into the two forces acting according to the two directions \(b d\) and \(b c,\) to which the other impelling from \(b\) to \(e,\) is as \(b e\) to \(b d,\) and \(b c\) or \(d e,\) respectively.

So likewise two forces, acting without the directions \(b d, b c,\) and being equivalent to the force acting without the direction \(b c,\) from \(b\) to \(e,\) will be to the force acting according to the direction \(b c,\) from \(b\) to \(e,\) as \(b d, b c,\) to \(b e;\) and therefore, the forces acting in the directions \(b d, b c,\) and equivalent to the force acting in the direction \(b e,\) are to the force acting in the direction \(b c,\) as \(b d, b c,\) or \(d e,\) to \(b e;\) that is, if a body be urged by three different equivalent powers in the directions \(b a, b d,\) and \(b c;\) these three forces shall be to one another as \(b e, b d,\) and \(d e,\) respectively.

This theorem, with its corollaries, Dr. Keill observes, is the foundation of all the new mechanics of M. Varignon: by help of which may the force of the muscles be computed, and most of the mechanic theorems in Borelli, De Motu Animalium, be immediately deduced. See Motion.

Composition of proportion.—If there be two ratios, wherein the antecedent of the first is to its consequent, as the antecedent of the other is to its consequent; then, by composition of proportion, as the sum of the antecedent and consequent of the first ratio, is to the antecedent, or the consequent, of the first; so is the sum of the antecedent and consequent of the second ratio, to the antecedent, or the consequent, of the second.

E. g. \(\frac{A}{B} : \frac{C}{D} = \frac{A + B}{C + D} = \frac{A}{C} + \frac{B}{D}\) or \((B) : C + D : C + (D)\). See Proportion.

Composition of ratios, in Arithmetic and Algebra, is performed by multiplying the quantities or exponents of two or more ratios together; the product is then said to be compounded of the ratios whose components were multiplied. Thus, if the quantities or exponents of the ratios \(b\) to \(c, c\) to \(d, d\) to \(e, f,\) be multiplied, we shall have \(\frac{a}{b} \times \frac{c}{d} \times \frac{e}{f} \times \frac{d}{c} \times \frac{e}{a} = \frac{a c e}{b d f} \times \frac{d}{c} \times \frac{e}{a} = \frac{a c e}{b d f}.\) And the ratio \(a e c\) to \(b d f,\) is then said to be compounded of the severals ratios \(a b, e, c; d, e, f, &c.\) Thus also the ratio of \(10\) to \(12\) is compounded of the ratio \(2\) to \(3,\) and of \(5\) to \(4;\) for \(\frac{3}{4} \times \frac{5}{2} = \frac{15}{8}.\) This operation is by force called addition of ratios. See Ratio.

Composition, in Music, implies harmony, music in different parts, according with each other; and by the mixture of concords and dissonances embellishing melody, and communicating at once, to a well organized ear, the double delight arising from the union of the two great conduits ingredients in music, MELODY and HARMONY. To be able to write down or dictate a melody or single part, does not exalt its author to the rank of composer; though many have assumed that title, who have not been possessed of science sufficient to make a base to a ballad or minuet.

As the term Composition implies the union of various ingredients we shall endeavour in the important article Counterpoint.
TERPOINT, from our own knowledge, and from the precepts and practice of the greatest masters of the art, to describe these ingredients, and point out their legitimate use. See Counterpoint, which is to nearly synonymous with Composition, that we know not how to separate them.

We take it for granted, before a musical student is inflamed with the ambition of becoming a composer, that he is perfectly acquainted with the elements of the art; that he has read, or at least heard, the principal productions of great masters; that he knows intervals, and their relation to the key note and distance from every other found of the scale. See Scale and Interval. That he knows the different measures or kinds of time in music, nor is acquainted with rhythm, nor where the accents of each bar should be placed. See Time, Accent, and Measure.

That he knows and feels the difference between concords and discord; is offended with false intonation, and instruments out of tune; feels something wrong in the regular succession of two sharp 3rd's or 6ths; two 5ths or two common chords rising or falling one degree; that he knows the compass and genius of the voice or instrument for which he writes. But we must not take much for granted, or, in order to save ourselves trouble, tease our readers with too many references to articles connected with composition, we shall therefore refer our readers to the article Counterpoint, (which we have laboured with great zeal) for the mechanical rules of composition; still reminding the young student, that the scale of eight notes ascending and descending, which represents the whole system in a major key, consists of 5 tones and 2 semitones; the 6th note being a recurrence of the same letter, and nearly the same sound, is included in the same key note or principal base.

Keys are denominated major or minor, sharp or flat, from the situation of the semitones. Let C represent all major keys, and A be the minor. In the major keys, the two semitones lie from the 3d to the 4th, and 7th to the 8th; and in minor keys, from the 2d to the 3d, and 5th to the 6th, ascending in the major, and to avoid accidental sharps, descending in the minor, thus:

Major key.
Ascending.

Minor key.
Descending.

A sharp or flat at the clef, or an accidental sharp or flat in the middle of a melody, changes the place of the fifth semitone; and two sharps or two flats change the place of both.

Of these eight notes, some are termed concords, and some discord. Of the concords, some are perfect, and cannot be changed by an accidental sharp or flat, without becoming discord. These are the 4th, 5th, and 8th, which furnish, when used in the lower part of the scale, a base to the regular ascent in the treble. See Scale, Fundamental Base, and Composer.

Composition, in Oratory, the order and coherence of the parts of a discourse.

As a part of general elevation, (which see) it regards the turn and harmony of the periods: and therefore to composition belong, both the artful joining of the words, whereof the style is formed, and whereby it is rendered soft and smooth, gentle and flowing, full and sonorous; or the contrary: and the order, which requires things first in nature and dignity, to be put before those of inferior consideration.

Composition consists of four parts; which rhetoricians call Period, Order, Juncture, and Number, which see respectively. Ward's Oratory, vol. i. p. 340.

Composition, in Painting, is that great and important requisite, the knowledge of which enables the artist to dispose all the various objects in his picture, as required by the subject, and furnished by the imagination or invention, in such a manner as to render them, individually and collectively, most conducive to the beauty, the effect, and the expression of the whole work. The objects furnished by the imagination or invention, may be considered as so many unmanufactured materials, which the science of composition teaches us to work up and display, as the peculiar circumstances of each case may require. Composition, in its general sense, may, therefore, be styled the ground-work of painting, upon which the superstructure, expression, design, chiaro-scuro, and colouring, in a greater or lesser degree depend; and the science of it opens a wide field for our consideration, as it supposes not only the knowledge of all the various combinations or contracts of lines and forms, which are calculated to produce agreeable or striking effects in general, but likewise, that judicious choice in their felection which may be most applicable to the distinguishing character and expression of each subject or work in particular. Composition, thus contemplated, is no longer confined to the artificial pyramid or the forced contrail, but embraces every possible diversity of arrangement and distribution, from the artless simplicity of Giotto and Masaccio, to the most studied and complex grouping of Buonarotti and Rubens.

In treating this subject we shall follow the same method which we pursued in our inquiries respecting chiaroscuro and colouring. We shall commence by taking a cursory view of the style of the first restorers of painting, then trace the principles and systems of composition at different periods introduced by their successors, and conclude by recommending such examples and such precepts, as we conceive may be most calculated to infuse the studetn's improvement.

The efforts of the early artists, Cimabue, Giotto, and their school, were entirely directed to one great point, the appropriate expression of the story to be represented; every kind of artifice was to them unknown, and their pictures may be compared to the simple unembellished dictum of the rude but faithful historian, or to the wild but uncouth strains of the untutored muse. These old painter, in their feretrical or reckless representations in the churches of Italy, seem to have considered the art in no other light than as a means by which to convey to the devotion of the people, and as they really believed the truth of those stories which they endeavoured to represent, (upon which perhaps a great deal depends), so they described every incident exactly as they supposed, or had been taught by tradition to believe, it had taken place. In their pictures of the Madonna, styled in the Roman church, the Mother of God, and in their attempts to give the image of that eternal being which man never saw, the effect was rendered more awful and impressive by the introduction of choirs of angels and saints, in regular order, disposed on each side and behind the throne; a more picturesque distribution of figures may be found, it is true, in the larger altar pictures of the more modern painters, Carlo Maratti, Luca Giordano, and others; but then

all
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solemnity and dignity are sacrificed. where the Virgin Mary, with the saints and angels, her attendants, were muddled together with a little decorum, as if a group of her children, at play in the street, had been the subject to be represented.

In all those pictures of the old painters, which may be more particularly styled devotional, we perceive an attempt to elevate the mind of the spectator to the contemplation of celestial enjoyments; in the pictures of the moderns, beginning from the death of the divine Raffaele, artifice is too apparent, and the subject seems too frequently to have been made subservient to the desire of the painter to display his own academic acquirements. Nature alone seems to have been the precepts of the old painters in composition, and hence that variety, and at the same time that simplicity in their works which we so much admire; but as they were extremely deficient in many necessary parts of the art, and particularly in the: three: drawing, perspective, and chiaro-obfure, it is not surprizing if, in the eyes of curious obfervers, their pictures have alone to be the merit of antiquity, and that interest which is necessarily attached to the early efforts of man in every branch of study.

Inflances, however, may be found, even in the works of the oldest painters, of compositions uniting at once propriety of expression, with beauty of disposition: amongst the numerous frescoes of Cimabue still remaining in the church of St. Francis, at Affi, there is in particular one, representing a dead Christ with the Marys and other figures, where, the subject naturally allowing of it, the artist has given such an agreeable form to the groups, by introducing around the recumbent figure of our Lord, the varied attitudes of figures kneeling and standing, as to leave little to be desired, have a greater perfection in the executive and mechanical parts of the art.

The works of Giotto, the scholar of Cimabue, may be studied with abundant advantage as to invention and composition. The church of Affi, above-mentioned, possesses an extensive series of the frescoes of this extraordinary child of nature, representing stories of the life and miracles of St. Francis; here the compositions, though ever subservient to the expression of their subjects, are in some instances so beautifully grouped, as to leave it almost doubtful whether, in this respect, they ever were surpassed even by the best artists of later periods. One of these represents the story of a nobleman of dissolute character, who having heard of the fame of St. Francis, invited him and his companion, another friar, one day to his table. The holy conversation of the saint had such influence on the nobleman, that he made to him a full and contrite confession of his sins, when, after receiving absolution, he instantly fell down and expired. Giotto has seized this moment. The women, relatives of the deceased, the attendants, all flocked, with varied expressions of grief, astonishment, and terror, to the corner of the picture where he lies an elderly man, (as it is necessary the connection between this group and the other) is represented imploring the interposition of St. Francis, who, rising from his seat, seems to pity their sorrow, at the same time that he endeavours to allay it by the consolatory assurance that the sins of their master are forgiven, and that his spirit is in peace. The friar alone, accustomed to behold miracles, fits unmoved.

In another of these frescoes, Giotto has represented the moment, when, after the death of St. Francis, his body was carried, in the way to the place of burial, to the convent of Sta. Clara. The bearers of the body, surrounded by a concourse of people, have relented the bier on the ground: Sta. Clara is taking a last look at the face of him who, in her youth, she so much loved, one of the suns is kissing the feet of the departed saint, a second bathes his hand with her tears, whilst others, with a gracefulness and tenderness of expression not to be surpassed, are advancing from the three doors of the church to pay their last duties to the object of their affection and veneration. The church itself, beautifully enriched with altars, gives the most agreeable termination to the group.

We shall mention one more of this series of pictures, which, though not in point of beauty equal to the two last-described, is applicable to our present purpose as it strongly exemplifies how much a proper disposition of the groups in a picture contributes to the expression of the subject. The story represented is a miracle which took place some time after the death of St. Francis. A woman from some cause or other died without making a full confession; she had, however, upon the whole been a good catholic, and especially devoted to St. Francis; she therefore made intercession for her, and when the priest with his attendants were upon the point of carrying the body to the grave, she, to the great astonishment of all present, sat up, called a confessor who was present by name, revealed to him her hidden sins, and then once more died and was buried. In the middle of the picture is represented the woman sitting up on her bed, in the act of confessing to a friar, who at once unites in his countenance the strongest expression of terror with the most earnest attention; some women, the friends of the deceased, and a child, form a group on the right; the priest and his attendants are on the left; both these groups are kept at a distance from the two principal figures, in the center, by which the heads of feet and a confessor, a leading point in the story, is more decidedly given, than could have been accomplished by any other manner of placing the figures. The intercession of St. Francis to our Saviour is represented in the sky; and a little below, the effect of that intercession is unequivocably described, by the introduction of a celestial agent, who is driving before him the infernal spirit, by which the woman is supposed to have been perplexed.

Amongst the principal scholars of Giotto we may enumerate, Taddeo Gaddi, and Puccio Capanna: of the former many admirable frescoes are still existing in the church and facade of Sta. Croce, and in the court of Sta. Maria Novella at Florence, and of the latter, great part of the roof or vault, besides two excellent compositions of the taking down from the cross and the burial of Christ, on the side wall of the lower church of St. Francis at Affi.

However, the school of painting founded by Cimabue and Giotto, continued with but little variation or advancement, till about 1430. when Masaccio distinguished himself by a correctness and perfection of imitation, hereto unknown. He began to throw a just notion of perspective, and first succeeded in foreshortening the feet of his figures, to as to give them the true appearance of standing on an horizontal plane: a difficulty never surmounted by his predecessors, whose figures, except when in profile, seemed generally, as if standing on tip-toe. He gave a great breadth of light and shadow to his groups, and was an excellent colourist; and the heads of his figures are so finely drawn, so full of nature, and finished with such a delicacy and at the same time such a mellowness of pencil, as to be scarcely surpassed by the finest portraits of Raffael, Titian, or Del Sarto. In all the executive parts of the art, Masaccio eminently excelled; but we cannot join in the opinion of those who consider him as having equally contributed to the advancement of composition: his aim was to make the most correct possible transcript of the model before him; hence
hence his frescoes, in the celebrated chapel at the Carmine, abound with admirable representations of his friends and contemporaries, portraits that seem almost alive, but they are not always alive to the spectator, nor do they express by their actions or gestures, those feelings which the act of which they are represented as spectators, should naturally awaken in them; in the miracle of the boy restored to life by St. Peter, and in the martyrology of the same saint, the surrounding figures seem no more affected than so many indifferent persons met together in the market place, to talk over the ordinary news of the day. However this work of Masaccio greatly contributed to hasten the great era of painting which followed, by exhibiting to contemporaries, portraits such as those of his friends and contemporaries, that we are now treating of. The great Raphael, indeed, that the contemplation of their manifold faults in this particular, may tend to deter the student from pursuing a similar line of conduct. The subject is here made sublunary to the rage of the painter for displaying his talents in portrait; these frescoes containing flaring reminiscences of almost every lord, lady, or literary character of distinction of his time; and as the figures are throughout dressed in the drapery of the time, so this work is valuable, as giving perhaps the best idea of the general character of Florence towards the end of the fifteenth century, of any in existence; and to this, that the whole is admirably executed; but the spectator may long dwell on the various beauties of this work ere he discovers that it is intended to represent the principal heroes of the New Testament.

The happy era was, however, fast approaching, when the profound Leonardo, the great Michelangelo, and the divine Raphael, were defined, not only to unite all the various excellencies of the old masters, but Likewise, by an unparalleled and happy exertion of comprehensive and elevated genius, at once to carry all those parts of the art, which must ennoble it, to a height of perfection beyond which the efforts of succeeding artists have never enabled them to reach; if indeed they have ever approached it in the four great points of invention, composition, expression, and design.

It was about the year 1503 that the Florentines formed the idea of decorating their great hall of council with productions of the pencil. Upon this occasion Leonardo da Vinci executed in a cartoon the alluring Group of Horsemen fighting for the Standard, so well known by the fine print of Edelhuck: a composition replete, but not crowded, and which exhibits the utmost energy of action, without extravagance, and the most striking and beautiful variety of contrast, without affectation; this was Raphael's model for the intricate groups in his "Battle of Constantine," and is the great prototype of all those battles and battles so daringly executed by the bold pencil of Rubens. That Da Vinci at the age of fifty should have so far surpassed the efforts of preceding painters is, however, less a matter of surprise than, that the youthful Buonsodt, who entered the lists with him, should, as agreed by contemporary writers, have borne away the palm.

The subject chosen by Michelangelo for his cartoon, related to the war between the Florentines and Pisans: the moment taken was an imaginary one, when some of the Florentine folders, who had been bawling in the Arno, are hastening out of the river upon the signal of attack, buckling on their armour, and rushing to the assistance of their countrymen, who had already commenced the combat in the distance. This subject naturally embraced a very great variety of character, action, and expression, and was certainly most happily calculated for displaying academic acquirements, and particularly that knowledge of the human figure which Michelangelo is universally allowed to have polished in a greater degree than any other artist of modern times, and which, amongst the Florentine painters, was considered as at least paramount to all the other parts of the art put together. It is perhaps to this last circumstance that we must attribute the very decided pre-eminent
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given to the "Cartoon of Pieta" (as it was called) over that of Lionardo, and which soon after occasioned his quitting his native city in disgust.

Considering these two celebrated works in every other respect, it would be a difficult task to determine to which belonged the preference. The figures in Da Vinci's group, it is true, were somewhat disfigured by the introduction of capricious ornaments on their armour; but, on the other hand, the Cartoon of Buonarotti wanted that breadth of chiaro-recto which that of his rival possessed. Each, however, in its way, is a masterpiece for invention, composition, design, and expression; and each, in its kind, perhaps still remains unrivalled. We refer the reader to a very animated description of the "Cartoon of Pieta" in the third Lecture delivered by Mr. Fufelli to the Students of the Royal Academy.

The subjects which Lionardo and Michelangelo had selected for the display of their talents, afforded in their nature the most ample scope for the intricacies of grouping, and the novel charms of contrast; but it was not sufficiently understood by many of the young artists, who sloped to study these works, that that which they so much admired, and which in reality powerfully contributed to expression in the Cartoons before them, might be inadmissible, or at best should be sparingly used, in subjects of a different character. This censure applies not to Fra Bartolomeo, Andrea del Sarto, and two or three others, rather contemporaries than followers of Michelangelo; but it is certain, that the indiscriminate introduction of contrasts, fore-shortenings, and naked figures, without regard to propriety or expression, soon became a predominant characteristic of the Florentine School.

In the subsequent productions of Michelangelo's pencil, we almost ever find the happiest concordance of style with subject, nor can he be accused of having at any time sacrificed the invention or expression of his picture, to an ostentations display of his powers in the executive parts of the art.

The general design of his sublimer works, the "Vault of the Sistine Chapel," and the "Last Judgment," will be the subject of our consideration, when we come to treat of invention and expression in painting; we shall, for the present, content ourselves with observing, that there is no part of them which affords not a valuable leçon in composition. The beautiful angels, attendant on the Creator of the sun and moon, give dignity to the subject at the same time that they enrich the composition. The angelic troop, supporting the figure of the Almighty, in the Creation of Man, by furnishing a number of small parts opposed to one large one, produces a delightful effect; whilst the broad dark mantle which surrounds the whole, at once simplifies, whilst it throws out the group; this rich group is again finely contrasted by the simple unembellished figure of Adam. In the compartment where Adam and Eve are represented eating the forbidden fruit, Michelangelo has laid himself open to the accusation of having been guilty of an anachronism, as he has introduced in the same picture their subsequent expulsion from Paradise; but, earth we commend his conduct, it will be well to consider whether the fault, if it is one, in the cafe before us, is not amply made amends for by the additional interest and the awful leçon it furnishes—here is at once the cause, and the effect; the transgression and the punishment. This group of the "Tranfiguration of Man" is particularly deserving of our notice, as it furnishes an example in composition different from any other in the chapel; the Eve is fitting in a beautiful posture on the ground, and nearly in front; she extends her left arm to receive the apple presented to her by the tempter, who is represented, like the Scylla of the ancients, under the form of a female terminating in a serpent; Adam is standing immediately behind the figure of Eve; he extends both his arms to pluck the fruit off the tree, and thus discover a back view of his figure from the loins upwards, thereby making a most beautiful contrast to the Eve, at the same time that it afflicts, by its union or connection with the serpent and the tree, in forming a sort of arch over the figure of Eve, which produces a most agreeable and novel effect. In that tremendous group of the "Offspring Israelites tormented by Serpents," the low point of light increases the terror of the scene, at the same time that, by causing the figures to be fore-shortened, it permits the introduction of a greater number of them, and of a larger size than could have been the case, had the horizontal line been suppos'd higher. The "Prophets" and "Sybils" might each in their turn furnish a leçon; but it would far exceed our limits to attempt to point out the various master pieces of composition with which the Sistine Chapel abounds. Each compartment or group contains some principle or excellence more or less distinguishing it from every other, and peculiarly adapted to the expression of the subject it represents.

The "Last Judgment" was executed many years after the Vault of the Sistine Chapel. With respect to the composition of this celebrated work, as a whole, there have been various opinions; some highly approving the uniform arrangement of the groups into distinct subdivisions, as contributing to that awful majesty required by the subject; whilst others have regretted the absence of that perspective, that depth, that sfondo, employed by so striking and picturesque an effect in the great works of Titian, Paolo Veronese, and Rubens. The matchless perfection of the distinct groups has however remained undisputed, and we can therefore with safety recommend the prints from them by Georgio Mannus, or those recently published by Mr. Netz, as fources from which the student will béat acquire the principles of grand composition, at the same time that he imbibes the antidote to poverty of style, and to every thing trivial or common-place.

We have before observed that the older painters considered a certain degree of uniformity of disposition as indispensable in these representations, which were more especially intended as objects of devotion or religious awe. Michelangelo, though in most other respects he departed from the system of his predecessors, seems to have considered this principle as sacred; accordingly, in his designs of Madonnas, Holy Families, and Pietas, we often find this uniformity; sometimes effected by the manner of placing the figures, and balancing equally, as it were, one side of the composition with the other; sometimes by the regularity of the architectural decoration. His "Christ with the Samaritan Woman at the Well" is an instance of this kind, to the "Flagellation at St. Pietro Montorio," and, more particularly so, his "Reparation of the Crucifixion," where the two angels in the clouds and the two figures of the Madonna and St. John, are introduced absolutely at measured distances on each side of the crouf.

Fra. Bartolommeo di San Marco has practised a similar uniformity of composition in his great altar pictures, and has not infrequently Raphael, although in many of his numerous small pictures of the Holy Family he seems to have aimed at the expression of domestic felicity or maternal endearment, rather than to elevate the mind to the contemplation of the mysteries of redemption by a sublime image of the Virgin Mother with the Infant God.
If the works of Michelangelo excel in sublime imagery, or in the personification of supernatural agency, those of Raphael, on the other hand, have ever been considered the most perfect models of that species of painting which is properly termed historical or dramatic. "We stand with awe," says Mr. Fuseli, "before M. Angelo, and tremble at the height to which he elevates us. We embrace Raphael, and follow him wherever he leads us." The works of Raphael never fail to exhibit the happy union of composition every way adapted to the expression of the subject, joined to an inexhaustible variety of well-arranged and beautifully contrived groups; and yet every part seems so naturally to grow out of the story, and comes home to our feelings, that the spectator is often almost tempted to exclaim, with the countryman when he saw Garrick, "Why should I have done it so myself?"

The productions of Raphael furnish nothing like a recipe for composition. He well knew there was none, and hence those forcible and distinct impressions which each of his pictures makes on the mind, and leaves indelible on the memory.

If Raphael can be said to have regulated his compositions by any particular rule or maxim, it was that of making each as unlike the other as possible, confident with propriety of expression. Thus, in the Cartoon of "Christ giving the keys to Peter," the apostles, all crowding together to be witnesses of the action, occupy the principal part of the picture, and form a group as it were in profile, the Saviour, although in the corner of the picture, being nevertheless rendered evidently the principal figure, by the inflamed situation given to him, as well as by the actions of the apostles, who all press forwards towards him, as to the centre of attraction. This Cartoon is finely contrived by that representing the death of Ananias, where the figures of the apostles form a group in the centre, and are all seen in front. The admirable description of this composition by Mr. Fuseli cannot but prove acceptable to the reader. "In the Cartoon of 'Ananias,' at the first glance, and even before we are made acquainted with the particulars of the subject, we become partakers of the scene. The disposition is almost theatrical, the fence is a spacious hall, the heart of the action is the centre, the wings affild, elucidate it with the ends. The apocryphal figure before us is evidently the victim of a supernatural power inspiring the apocryphal figure, who, on the raised platform, with threatening arm pronounced, and with the word enforced his doom. The terror occasioned by the sudden stroke, is best expressed by the features of youth and middle age on each side of the sufferer; it is insinuant, because its shock has not yet spread beyond them, and this is done not to interrupt the dignity due to the sacred scene, and to flamp the character of devout attention of the assembly; what preceded and what followed is equally implied in their occupation, and the figure of a matron, entering, and aborbed in counting money, whilst the approaches the fatal centre, and whom we may suppose to be Sapphira, the accomplice and the wife of Ananias, and the devoted partner of his fate. In this composition of near thirty figures, none can be pointed out as a figure of common place or mere convenience; they are linked to each other, and to the centre, by one chain; all act, and all have room to act, repose alternates with energy." The Cartoon of "Peter and John healing the cripple at the Beautiful Gate of the Temple," is again strikingly different from either of the others. Raphael having, by nobleness of which any but a sublime genius would have been incapable, intersected his composition by the columns of the portico. But though divided, it is true, into separate, and almost equal parts, neither the unity of action, nor the expression of the picture, is impaired, whilst the effect produced is at once novel and beautiful. In the Cartoon of "Paul preaching at Athens," the elevated situation, and energetic action of the Apostle, splendidly denote him the hero of the piece, whilst the attentive but astonished circle gathered round him, receive, as it were, light from him, their centre, and unequivocally declare him the resplendent organ of divine truth.

The Series of "Scripture Histories," painted by Raphael in the Loggia of the Vatican, and his other works, do not less evince the desire of obtaining, as far as consistent with propriety of expression, this diversity in his compositions; but an attentive examination of the prints from them, will better elucidate this point, and induce every thing relative to composition, than a volume of prolix and laboured description. In short, the works of Raphael display the most becoming union of natural with acquired talent, strength of conception, and inexhaustible invention, with propriety of disposition in the whole, and oddities in the component parts.

After the death of this great master in 1520, the art rapidly declined, nor has any one since him tried with equal success the dignified and instructive path of history-painting.

The great reputation of Raphael, however, even for some time after his death, checked the ascendency of mitred principles, at least in Rome, where the great works in the Hall of Constantine, and other rooms of the Vatican, were still continued by Giulio Romano and Raphael's other scholars, after their master's designs.

Of Polidoro da Caravaggio, one of the most eminent, it might be said that the soul of a Greek animated his pencil, to replete with Attic purity and grandeur of style are his numerous frescoes on the facades of the palaces of Rome, now however better known by their prints by Grottius, Cherubino, Alberti, and Bartoli.

It was not till after the noted sacked of Rome in 1527, when the arts and artsils were forced to seek an asylum in distant parts of Italy, that painting was doomed to suffer degradation; Polidoro flew to Mezina, Pierino del Vaga to Genoa, and Giulio Romano to Mantua, where, in the palace of the T., he explored the regions of poetry, gave new force to the instructive lessons of fable, and decked the playful charms of allegoric fiction; still however firm to the principles of his great instructor, nor ever forsaking the true end of his art, the expression of the subject, to a too oftentastened display of his prowess in the means.

We have before observed that Michelangelo's celebrated Cartoon of "Piaf," contributed not a little by its influence to determine the future character of the Florentine school. Blind to its more sublime excellencies, the vigour of its conception, the energy and variety of its parts, and its unity of action as a whole, the young students of Florence ignorantly imagined that a similar introduction of naked and shortened figures into their compositions, without any reference to the subject of their pictures, would at all times infuse them the appaance of the artificers of their own country, and the envy of those of neighbouring states; nor had Michelangelo the good nature or the good sense to point out their error.

An army of expert mannerists, for the most part joining to a miserable felicity of conception the most audacious rapidity of execution, but proud of polishing what they thought the true secret of the Grand Gyle, now felled forth; nor can it be a matter of surprize that the palaces, the churches, and the halls of Rome, Florence, and part of
of the other cities of lower Italy, were so soon degenerated
with the common-place productions of mediocrity, since
the unrelenting pencils of Giorgio Vasari and Federigo
Zuccaro alone, covered many square yards of wall or canvas
that had been effected by the honest diligence of perhaps
any ten of their predecessors.

The due expression of the subject of a picture was now
the last consideration. Provided two or three well drawn
academy figures, however unmeaning, occupied the
foreground on one side, and some women sporting with
their children, on the other, whilst the centre displayed a
pyramidal group, all was well; the employer was delight-
ded, and the painter applauded. Thus a stranger may
pass and repass through the Sala Regia in the Vatican with-
out being struck by, or discovering the meaning of one of
these frescoes which occupy its spacious walls, or without
being afterwards enabled to call to mind the familiar feature
distinguishing one from the other. This subversion of art,
this silly fuss, for what was erroneously considered pic-
tureque composition, for nearly a century afterwards degraded
the school of Rome and Florence; we shall therefore leave
them, and turn the reader’s attention to those of Lom-
bardy and Venice.

If the anatonic studies of the old Florentine artists had
rendered them almost exclusively the masters of correct
design, the painters of Lombardy could boast a more com-
plete insight into the doctrine of perspective, and were cer-
tainly the first who applied it with real effect in large
works.

Melozzo da Forli, in the middle of the fifteenth cen-
tury, in his fresco in the vault in the tribuna of the church of St.
Apolloni at Rome, first discovered what the Italians call the
knowledge of the Sotto in Suo, that is, the method of fore-
shortening figures, so as to give them the due appearance of
rotundity and projection when seen from below: and upon the
same principle, Andrea Mantegna, in several of his great
works, and particularly in a chapel at Padua, where theordained
compartments are entirely above the eye, adopted, with
equal boldness and effect an ideal point of light upon a line
with the eye of the spectator, that is beneath the very bot-
tom of the picture.

From sources like these, Antonio Allegri da Correggio,
the splendid meteor of the Lombard school, imbibed the
first principles of his art. With a spirit every way con-
formable to his name, he pictured the "Joyful Assumption
of the Madonna amidst Myriads of the Anceic Holt," in the
cupola of the duomo of Parma, and the "Assent of Chrift,"
in the church of S. Giovanni in the same city; works which he
justly styled the never-equalled models for that species of composition.
In the execution of theft,
and probably of his other chief works, he was however
greatly afflicted by his friend Antonio Begarelli, a celebrated
Moldese sculptor, who modelled for him in clay all the
figures, so that Correggio, by placing and grouping them
together as they were to be represented, was enabled to de-
linate, with the greatest correctness, ever fo forthshortening,
and at the same time to acquire a truth and boldness of
light and shade unattainable by any other means. And
here it may be well to observe, that the trouble of pre-
paring such models in the first instance, is amply repaid by
the great facility, or rather certainty, which it gives the
artist in the execution of his work. Moreover, the painter
having his modelled figures before him, and being enabled,
by varying the situation of his eye, to view them in every
direction, will frequently discover beautiful combinations
which he never dreamed of, at the same time that he is
rendered less liable to the error of too often repeating the
same view of a figure, or the same action, and is taught to
avoid a common-place mode of composition.

Primaticcio, a native of Bologna, in his commerce with
Giulio Romano, whom he assisted in his works at Mantua,
acquired an admirable talent for treating poetical subjects.
Master of perspective, and the Sotto in Suo, his beautiful
fictions on the ceilings, and other compartments, in the pa-
lace of Fontainebleau, alike charmed by the fire with which
they were conceived, the elegance of their composition, the
prodigious boldness and truth of their effect, and the easy
grace with which they were executed.

The grandeur and striking appearance of projection and
depth, for which the works of Primaticcio were to remark-
able, judging as well by their prints as by the writings of
those who witnessed them prior to their destruction, was in
a great measure occasioned by his having universally chosen
what is called in perspective a short point of distance; by
which mode of conduct the figures in his near-ground ap-
ppeared proportionally large, as those behind diminished in a
more rapidgraduation. This mode of conduct in Primatic-
cio is the more worthy of remark, as it is the reverse of
what we generally find adopted in the works of the great
Roman and Florentine painters, his predecessors. It be-
came, however, a favourite doctrine of the Venetian school,
particularly of Titoreto and Paolo Veronese, and was one of
the leading principles of the Caracci in the formation of
their style.

The composition of Giorgione, Titian, and the other
Venetian painters, is simple and dignified, suggested by the
subject alone, and of course liable to none of those objec-
tions which appertain to the works of their followers, Ti-to-
reto, Paolo Veronese, Palma, and a multitude of others,
who, like the Florentines, valued themselves Chiefly upon
the possession of only a part of the art, sacrificed to their
favourite dainties all the remainder. No longer expression,
but colouring and glitter of effect became their object, and
hence, with all their prodigious talents, they soon turned
the art into a splendid toy.

The works of these great masters (for great they were in
spite of all their faults) may nevertheless be studied with
benefit, even as to composition, as they at all times poise a
balance and variety of different parts, which rank them far
above the infidel and man-trèd performances of their contem-
poraries of Florence and Rome.

About the end of the 16th century, the Caracci of
Bologna attempted, by an union of the scattered excellences
of the various schools before mentioned, to establish a perfect
system of art: but though they indeed so far succeeded as
to form a little in which no particular fault seemed to pre-
dominate, still in no one point did they fully reach the pur-
poped objects of their emulation. Their works present
neither the dignified composition, the just and striking ex-
pression, the beautiful variety of character, which dis-
guishes the work of Raphael; the sublime conception, or
the learned and grand design of Domenichino; the grace and
enchancing effect of Correggios, nor the truth and richness of
Venetian colour; but from rather the result of a style
founded on the basis of a compromise between the eye and
the understanding, the mechanical and the ideal of the art,
in forming which compact, however, the former have been
evidently allowed the preponderance. This remark is, per-
haps, less applicable to the productions of Ludovico Ca-
acci; but with respect to the chief works of Annibale, and
particularly his Farnese Gallery, which cannot fail to hold our
affection to the critiques of Mr. Fuseli, and the severer but jvel
remarks of Mr. Webb.

Having said thus much, it cannot be expected that we
should
should hold forth the Caracci as models for imitation; there is nevertheless a breadth, a concordance of the various mechanical parts of the art, and an ease in their style which render it highly deserving our regard, and would have fully entitled the Caracci to a reputation even greater than that which they have so long enjoyed, had their prodigious powers been made the vehicle of more elevated conception.

With respect to the scholars of the Caracci, and other artists of reputation, who immediately succeeded this epoch, it is only to our present purpose to observe, that grace and beauty rather than grandeur or sublimity, seem to have been their objects, and that whatever eminence they sometimes attained in their Holy Families and devotional subjects, fitted the dignity of historical painting was evidently on the decline.

Niccolo Poullin alone seems to have considered the art as a language addressed to the mind through the organs of vision. Possessed of a refined and frutimizing mind, he at all times collected, and, with the greatest ingenuity, inferred in his pictures all those collateral circumstances, probable or possible, which his subject could furnish; and hence his works, more addressed to the imagination than the eye, at once invite and are sure to reward investigation. The greatest defect, however, of his compositions, seems to be that these explanatory or accessional groups generally appear too principal, and thereby not unfrequently counteract their object, by detracting the attention from the principal figure or group, destroying the unity of action, and weakening that expression which they were intended to augment. Were we to draw a comparison between Poullin and Raffaele, we should liken the former to the cool but subtile refoner, who by slow degrees brings us to grant his position; Raffaele to the heaven-taught genius who at once darts the ray of truth upon our minds.

The works of Poullin, though esteemed even in his lifetime, had little influence in correcting the corrupt and meretricious taste which was every day gaining ground in Italy. The proper end of the art had been long forgotten or habitually sacrificed, and that bane of painting, picturesque, or artificial composition, which, however varying in its mode, was ever the same in its effect, became every day more deeply rooted.

Poverty of conception, or rather no conception at all, common-place or unmeaning attitude, contrari to often repeated as entirely to lose its effect, and, above all, empty bubble, were now become the elements of what was still called historical composition: if to this we add a brilliant rapidity of execution, joined to gay colouring and tolerable light and shade, with occasionally a madonna's or an angel's head, rather pretty and seductive than devout, we have the sum total of the merits of the most eminent artists who succeeded this period, and the genuine characteristics of the admired Pietro da Cortona, the facile Luca Giordano, and the infidip Carlo Maratti.

It would swell this article beyond our preferred limits, without throwing much additional light on our subject, were we to attempt to trace the different changes of style which at various periods took place in the schools of painting of Germany, Flanders, Holland, or France. The succession of young students, who at all times considered a visit to Italy as an indispensable part of their education; naturally imbued in a greater or less degree the principles of taste to whom they had been taught to look up as models for their imitation: hence the style of the Florentine and Roman mannerists of the 16th century, unjustly denounced the followers of Michelangelo, was caricatured in the preposterous works of Martin Heemskerck, van Man.

Rubens, however, who, though long in Italy, became no wife infected by that poverty of style which then prevailed, broke the fetters of corrupt system, and refuted his countrymen from the effects of such base influence. His comprehensive genius, cultured by reading, enlightened by travel, and blest, above all, with that envied quality, a just appreciation of its own powers, could not but obtain its object, that object being once clearly defined and steadily pursued. What that object was, the decided character of his works sufficiently determines: it was unquestionably the union of magnificent and expressive composition, with the most splendid colouring and the greatest breadth of chiaro-fuoro; for, however enchantcd by the spells of colour, Rubens never forgot that painting is mute poetry, and its first great prerogative, the convert; which, through the medium of the eyes, it is permitted to hold with the understanding. It cannot, therefore, be said of Rubens, as of the Venetian painters we have cenured, that he sacrificed the ideal to the mechanical part of his art. With the exception of his smaller works, or such as he was sometimes necessitated to undertake, in compliance with the will of his employers, we generally find in his productions the most judicious application, the most happy combination of his powers:—Subjects allowing full scope to the exuberance of his invention, compositions furnishing an ample field for the magic blaze of his tints, and the broad expanse of his malleus.

It was the good fortune of Rubens that the burines of the most eminent engravers were employed under his own inspection, to make prints from all his chief works; and indeed so admirably is the character of the originals preferred in those of Bleeuwrt, Volterm, Pontius, and others, that when the pictures shall be no more, they alone will be sufficient to eternize the claims of this great master of the Flemish school. As an inventor and composer, the "Battle of the Amazons," the numerous "Huntings of Wild Beasts," the "Raising of the Crof," the "Michael combating the Devil and his Angels," and the two tremendous representations of the "Fall of the Wicked," are alone sufficient to place Rubens in the first rank; to lay nothing of his celebrated "Garden of Love," and the truly poetic allegories in the "Luxemburgh gallery."

Of Rembrant, the great head of the Dutch school, it has been justly remarked by Mr. Fuchs, that he was "a genius of the first class, in whatever relates not to form." We have in another place spoken of his chiaro fuoro, (see Clair Obfure,) and we can, with equal propriety, upon the present occasion, recommend the study of his works to all those who feel with us, that the telling of the story, and the appropriate expression of the subject are the true ends of composition; nor will we omit to add, that the works of many of the other Dutch painters, particularly Oskade and Dwwer, however the humble representations of low and vulgar nature be their object, abound in admirable examples of composition, and may be studied with advantage, even by such as make the more noble path of historical or epic painting the course of their pursuit.

In the retrospect we have taken of the styles of composition at different periods, adopted by the schools of Italy, it has been our care to point out to the student such examples as are best calculated by their influence to promote his advancement towards the legitimate end of our art; at the same time, that we have cautioned him against that corrupt but specious system of grouping, which, for dilution's sake, we have called picturesque.
The art of painting is a language addressed, through the medium of the eye, to the understanding; like that addressed to our minds through the ears, it must have some ideas, some truths to communicate; and the perfection of painting, as well as of writing, consists in conveying those truths to the mind in the most clear, the most forcible, and most beautiful manner. A judicious distribution of the arguments in a discourse is of importance, inasmuch as it gives additional force, and finds increased interest on the evidence contain'd; but in a picture this propriety of distribution is itself the argument and the evidence, and is therefore indispensable.

Those who are conversant with the first sketches and drawings of great masters, know that a few simple rude lines are frequently found sufficient to impress the mind with a decisive and immediate idea of the story meant to be represented, and that, in many cases, even the expressions as well as the actions of the chief figures seem evident, although no features of the countenances be delineated.

We may, therefore, safely affirm, that any rule, any mode of composition, except such as is dictated by the subject of a picture, is wrong, and that, were this doctrine sufficiently understood, we should not so frequently pass unversed by graphic representations, or remain ignorant of the subjects they were intended to express.

To attempt, therefore, to prescribe any general method of distribution would be to insult the understanding of our readers and to degrade the art. The painter, warmed by his subject, must form the ideal picture in his imagination, and then transfer it to the canvas: it is only as to the relative economy of the parts of the work that some hints may be suggested: these are the result of observation and experience, and bear the strictest analogy to the precepts we have inculcated respecting chiaroscuro and colouring, and, perhaps, to every other part of the art.

As there should be in a picture one principal mass of light, which, however connected with others, should still predominate: so one group or one figure should strike the eye with the same superiority over the secondary groups or figures of the composition; as in chiaroscuro there is no rule by which we are obliged to place the principal light in any one given part of the picture; so are we at liberty to give to the chief group or figure of the composition that situation which we judge most appropriate. As in chiaroscuro, inequality of parts, a subdivision of several main masses to one larger one, never fails to produce richness and beauty of effect; so in composition a similar richness and beauty are the result of an opposition of several small bodies or parts, to one large and simple; as we have before illustrated by the sublime group of the Almighty, supported by a multitude of angels, in the "Creation of Adam," by Michelangelo.

As by the addition of smaller masses of light, connected with the principal masses, that mass acquires at once greater breadth and influence; so the unity of action in a composition is in most cases powerfully augmented by a repetition of nearly the same action in two or three of the accessorius figures arranged together, one nevertheless being principal: this was the frequent custom of Raphael; it has its foundation in nature, where similar sentiments most frequently excite similar outward demonstrations, and never fails, if judiciously managed, to produce its effect.

Everything that has been said relative to contrast of chiaroscuro, or relieving dark or light masses immediately by their opposites, equally applies to composition, where strong contrasts of line, of back to front figures, &c. produce similarly striking and beautiful effects, and must to infuse those effects be used with similar discretion and parimony. The too frequent introduction of contrasts of lights and shadows or of colours, produces a spotty and confused effect; the inordinate use of contrasts in composition produces fancied confusion, and defeats their end. The moderate introduction of them in both cases gives a zest to the picture. It is like the border or other well-disposed ornament on a piece of drapery; but when indiscriminately used, the work refumbles the rich gothic medley of an embroidered petticoat, where the beautiful folds of the stuff are wholly obscured by tinsel and gewgaw.

Having observed thus much, we must refer the reader, who is desirous of obtaining a more complete insight into the subject of this inquiry, to the works of the great masters above-mentioned, or to the numerous prints which have been made from them, by the most eminent engravers of the last three centuries. One hour spent in the study of the Cartoons of Raffaèi, or the Last Judgment of Michelangelo, will perhaps teach more than could be inculcated by words in the contents of this volume.

What we have laid of historical composition may equally apply to landscape; each work should possess a decided character, distinguishing it from its neighbour, and calculated to incite a train of kindred reflections. This we sometimes find in the simple views of the Flemish and Dutch painters, who painted nature as they found her, and did not think it necessary that every picture should possess a given proportion of fore ground, middle ground, distance, and extreme distance; a winding road, a meandering stream, a water-mill, a church steeple, a hanging wood, and a mountain.

The works of the two Poufì, some of those of Salvator Rosa, Dominichino, and the Caracci, and the admirable etchings from the drawings of Titian, abound in the finest examples of sublime and characteristic landscape, and are indeed so perfect in their way, that they can never be sufficiently contemplated by the artist who would attain eminence in this delightful branch of art.

Plates illustrative of composition.


2. "The Cartoon of Pisa" (or according to Vafari, their chief group) by Michelangelo Buonarotti.


4. "Groups of the Last Judgment," by the same author in the same chapel.

5. "Paul preaching at Athens" from the Cartoon, by Raffaèl, at Hampton Court.


Composition, in Pharmacy, the art, or act, of mixing ingredients together into a medicine; so that they may aid each other's virtues, supply each other's defects, or correct any ill qualities thereof.

Composition, in Printing, ordinarily called composing, is the arranging of several types or letters in the composing-floor, in order to form a line; and of several lines ranged in order in the galley, to make a page; and of several of these to make a form.

The composing-floor is made of iron generally, sometimes brafs or wood; of greater or less length or depth, according to the page to be composed, or the compositor's fancy: it hath two lining pieces, to be fastened by means of a nut and screw, which are hinged forwards or backwards, at the pleasure of the compositor, and according to the space...
force which the lines, notes, &c. are to take up. See Plate Middelmay, Fig. 5.

The composing-flick ordinarily contains seven or eight lines of a middle-sized letter; when, when set, are taken out, by help of a thin slip of brass, termed a rule, and disposed in the galley; and others composed, till a page be formed. The page being composed, is tied up, and set by; and the rest of the pages of the sheet prepared in the same manner: when done, they are carried to the imposing or correcting-rome; there ranged in order, and disposed in a chafe, or iron-frame, fitted with wooden furniture; then, the quires being struck in, it is carried to the press to be printed.

Composition, in Sculpture, from Compouisions, Italian, the art of placing figures or other objects together, whether by entwining them in groups, or forming them into masses more nearly or diffily apportioned. The word bears the same meaning in the arts of design as in literature, from which it was most probably received, with many other terms, by the Italian artificers at the revival of learning. Although in its most simple sense it is only synthesis, or joining together; yet, in its extended application, it comprehends the production, order, and fitness of all the parts contained in the whole. The first elements, therefore, are invention and sentiment; the invention should be new and copious, affording an abundant choice of beautiful parts according to the subject, whether there be many figures or one only; the sentiment must be just and striking; according to the rule “feel yourself if you would make others feel!” this must pervade every part of the character of the figures; their action or passion expressed to the points of their fingers and toes as well as in the very folds of their drapery.

The order of composition contains the divine, heroic, and historic. The divine contains all sublime and terrific subjects of divinities, angels, departed souls, and infernal ministers. The heroic, according to the ancients, consists of those mortals, said to have one mortal and one immortal parent. The historic class contains the whole series of human life, in which however the most exalted persons and circumstances are always to be preferred.

The arrangement must be dramatic, representing an action; because sentiment only affects the countenance of the figure prior to action, and words cannot be expressed by mute figures; therefore the sentiments and passions must be demonstrated by the action, in which the figures partake. The principal person must have the most distinguished place, while the inferior person is the most distinguished; thus in “Prometheus chained.” Prometheus occupies the first interest and place, whilst Force, Strength, and Vulture are grandly inferior, although linked in the same group. If the hero or heroine of the subject be not entwined in the same group with other figures, he or she will be distinguished by a preferable situation to those in which the inferior persons are placed: this rule is observed in all the best pictures of the Herculaneum collection. In the antique baffe-relievos and painted vases, and in the best works of antiquity, we scarcely ever see more figures introduced than such as are sufficient to tell the story, and for this reason that the expression may be the stronger, being less divided.

Outline. The general outlines of a composition, whether it consist of one or more groups, should be agreeable to the eye, which is produced by a succession of curves of different segments alternately reversed; or, in other words, a succession of S. lines of different curvature and dimensions. These will be more gentle in tender and graceful subjects, such as the Triumphs of Hymen, Achilles, and Sea Divinities, the Judgment of Paris, &c. In the antique baffe-relievos, the curves become more violent with a mixture of angles in subjects of great exertion, such as the War of the Giants, the Battles of the Lapithes and Centaurs, the Athenians and Persians. See Stuart’s Athens, vol. ii. Museum Pium Clementinum. Baffe-relievos. In the fine antique groups, as the Laccoon, Niobe and her Daughter, Cupid and Psyche, and the Fauns and Nymphs, the lines are interwoven (chained) as it were linked into each other in whatever view they are seen.

Light and Shadow. Sculpture is not like painting, seen and forced on our perception, by the variety and brilliance of its colours. On the contrary, it has properly no colour at all; and its forms are underlaid by the effect of light and its privation, with the degrees of their medium called middle tint; these, in fact, produce the all of sculptural forms to the eye, because such a thing as outline really exists, and when we speak of it or use it, it is only to demonstrate form geometrically. Light and shadow will be continually varied in the varied forms of the human figure. If seen abroad in the open air, or illuminated from a sky-light within doors, the light will strike most powerfully on the head and breast, and gradually with less force on the lower part of the body and inferior limbs as they approach nearer to the earth. If the figure be recumbent, or in any horizontal position, those parts will have most light which are nearest to the luminary. If the figure be inverted, the bottoms of the feet will have the strongest lights, which will gradually diminish as they approach the head; and consequently all those parts which are shadowed, when the figure is upright, will be lightened in this position, and vice versa.

It must be remembered that, as the human figure partakes of globular forms, some one part will be lighter than the rest, and that light will be brightest in one point. It will be found that figures in sculpture are almost covered with middle tint, having a small portion of bright light nearest the luminary, with a very few dark and strong shadows which relieve particular projections. Baffe-relievos present the general effect of darkish figures on light back-grounds; in distribution of quantity, of both lines and form, that will be most agreeable which is inherent in the nature of things, which pervades all creation, and is more particularly evident in musical proportion of thirds, fifths, and fifths, with their subdivisions and relative quantities.

We must however observe, that the rules for composition, like all other rules laid down for liberal art, will only assist genius; they will never produce any thing without the vigorous exercise of mental powers and manual industry, in the fabulous investigation and diligent imitation of nature; all must be done by sympathy and beautiful representation; rules may be compared to the compass for raising a building. We must therefore remember that the beauties of nature are also various as they are endles; and from them only we can furnish ourselves with original materials for composition, by continually observing the expression of sentiment and passion in men, women, and children; the characters of their faces, the forms and action of their limbs, their draperies, and the manner in which the direction of the folds of the clothes or indicates the bodies or limbs, in the grouping of figures; the entwining of the limbs should be carefully observed, and the planes in which the different parts of the bodies and limbs are directed.

In the liberal arts, the sentiment of a composition applies to our sympathetic feelings, as the invention for prizes and delights by its novelty, and both together animate the mas as a body is animated by the soul; and as no composition would be complete or interesting without them, so when these vital principles are obtained, great care should be
be taken to confine their demonstrative forms within that department of art to which they belong, in order that the whole may be as pleasing as interesting, without deformity or absurdity. Thus, for example, all those positions which extend the human figure by violent action should in bas-reliefs be represented in the flattest view, in which all the lines of the body and limbs may be underfoot in the fullest and clearest manner, without legs or arms standing out horizontally from the back ground, like scaffold poles driven into a wall. Such extended members belong only to the class of entire sculpture, as ãtucs and groups. The lines and limbs in the composition must be more parallel to the back ground, as the alto-relievo or baso-relievo recedes from entire sculpture, until, in the flattest relief, the most complicated forms and groups are distinguished by little more projection than an outline gives.

COMPOSSIBLES, COMPOSISSLIA, in Logic, such things as are compatible, or capable of subfiling together.

COMPOST, in Agriculture, a term signifying that fort of manure which is formed by the mixture or combination of one or more different ingredients with dung or other similar material, so as to constitute an uniform mass or substance fit for the improvement of the soil.

Thse comports are usually made by mixing various substances with fable or yard dung; and hence, in some countries, are called mixes.

The most common materials for this purpose are turf pared from walk places, virgin earth, peat earth, lime, the scourings of brooks, ponds, and ditches, weeds, sea-land, rubbish of buildings, coal-ashes, &c. That dung alone, properly managed and applied, is a most valuable manure, is beyond all doubt, but it is certainly not equally useful in all soils and situations. It is much better calculated for active than inactive soils. On lime-dune, chalk, &c., it meets with abundance of active materials; but upon clays, deep loams, &c., it operates best in conjunction with lime or some other stimulating substance. When dung is intended for a compost, no attempts should be made to add a large quantity of lime, earth, &c., till it is properly fermented, every addition of this checking the fermentation. The lime, earth, &c., should be added after the fermentation is finished, and the whole then carefully mixed, and laid up together. In a few days a second fermentation will come on; and if the mixture has been properly turned over and properly incorporated, it will be fit for use in a month or six weeks. Some judgment and attention will be requisite, with regard to the quantity of lime and other active principles employed; for, if the quantity be small, their action upon the rich substances in the dung will be partial and imperfect; and if too great, a considerable loss may be sustained by their over action. If the quantity of earth also be too great as to press the dung too hard, the air will be excluded, and the second fermentation be impeded or prevented. It is certainly a right method to lay a good coat of earth as a foundation for the dunghill, into which the moisture of the dung may sink down; and it is no bad way to make a heap of such substances as can be readily obtained, apart from the dung, and to throw the moisture of the dunghill, and the urine of cattle over it frequently.

The composts employed by the farmer are formed in various ways. In some places where there is a head or foot ridge, too high to admit the water being readily discharged from the field, they plough it, then fill it full of lime, dung, or both, and, after frequent ploughings, spread it upon the field. After the lime by these means is fully intermixed, the earth may be gathered into a heap with the spade, and mixed with dung; or the whole operation may be performed with the spade, which is still better.

It is remarked by Mr. Young, that "the farmer may have great advantage from composts; which, when they contain of proper materials, and are skilfully mixed, he may safely depend upon. Where a variety of materials can be had, they may, he says, be laid as follows: first clay or strong earth, next soap ashes, dung, loamy earth, lime, turner's bark, green vegetables before they run to feed, earth, or as many of these as can be got; also fat chalk, fen-weeds, fen-land, and several others; which may be so mixed, as not only to raise a general fermentation throughout the whole compost; but likewise to suit the nature of the land on which it is intended to be laid. The common way is to lay the several materials in layers, one over the other, till a large heap is raised; and it is advised by some authors, and the practice of many farmers, is, to make these layers from six inches to a foot in thickness: but this he has found by experience is wrong. For the fermentation raised in the compost is not strong enough to penetrate these thick layers, especially those of clay, or strong earth; for after the red have sufficiently fermented, and the compost is turned, these layers ride alms; as whole as when first laid, and must be broken by hand, to mix them with the rest of the compost; whence arise two inconveniences, one an extraordinary expense, and the other that twice or thrice turning is sometimes necessary to diffuse these large pieces; and as a new fermentation is excited every time the compost is turned, the strength of the manure is greatly wasted before it is laid upon the land, where it is then incapable of raising any considerable fermentation, which is, he thinks, one of the principal ues of manure."

It has been suggested, that the best way of making compost is not in thick layers; but after the ground is marked out for the compost, to lay the several materials, after being well broken, in heaps round the space marked out for the compost heap; and to place a man between each two heaps, to throw the manure spreading upon that space. In this manner, the compost heap will soon be raised to the intended height, and the several sorts of manure being thus well mixed, the whole will soon begin to ferment, and will incorporate as fully in two months, as the same manures, placed in layers in the usual way, will in four or five. The owner, therefore, in making such composts, should not prepare them too long before they are laid upon the land; otherwise they will be much wasted, and their bulk evaporated and destroyed. And "composts prepared in this manner need not be turned, or at most not above twice. If the fermentation is observed to abate too soon, holes should be made with a pole from the top almost to the bottom of the heap, upon which throw urine, or the returning of a dunghill, which will fill the holes, force through the whole substance of compost, and soon complete the fermentation." It is added, that "such a compost, by duly proportioning the ingredients, may be made to suit any sort of land, and is excellent for meadow or pasture grounds. A way to improve these, is to cut them live or fix inches deep with the five-cuttered cutting plough, or fascinator, which cuts the surface in chips four or five inches asunder, but does not raise or turn them. This cutting of the roots of the grass, and the manure laid on at the same time, linking into these incisions made by the coulter, cause an improvement in the quality of the herbage, and also make such grass grounds produce much more than they did before. But here it is to be noted, that cutting the ground first, and then laying on the manure,
ure, makes a greater improvement than manuring by, and then cutting; and both are superior to manuring and not cutting; all which have been proved by experiments. The cutting-plough is used with success upon clay grounds, loams, and gravel; but in very strong grounds, the cutters are apt to be thrown out of their work by clods; and therefore, it is not proper to use the cutting-plough where clods abound to any great degree"

It is added, that "in such composts, where it is intended to use a large proportion of earth, that lies at a considerable distance from the limekiln, to have the double carriage of it to and from the compost heap, the dung and other materials may be carried to a head land of the field to be manured, and be there mixed into a compost."

It is contended that "the bell situation for a compost, is upon level ground; or if made upon a deficient, a trench should be cut on the lower side to receive the running of the heap, which is some of the bell part of it, and is old from time to time be thrown up again, which will quicken the fermentation."

It is supposed that "the richest composts may be made in the farm-yard, which should be made deepening all round from the sides to the middle in form of a hollow ditch or bafon. When the yard is made in this form, little of the urine or liquid part of the manure can run off or be walked. When the dung is carried from the stables, cow-houses, &c. into the farm-yard, it should not be thrown carelessly in heaps, each fort by itself, but carried in carts or wheelbarrows, and laid regularly, and spread all over the yard. Upon this should be spread a thin layer of earth, mud, the flowerings of ditches and ponds, green vegetables before they run to seed, and other such materials as are most suitable to the nature of the land, to be manured with them. The rafts and cribs out of which the cattle are foddered, should be frequently moved over the yard, that the offal straw and hay may be equally differed, and trod in by the cattle. This method of spreading the dung and other materials being continued, the whole will be incorporated with the urine of the cattle, and make an extraordinary rich compost."

It is supposed that the only inconvenience of this kind of compost, is its being filled with the feeds of weeds, from the earth mixed with the hay, straw, and dung of the cattle. It is, therefore, a manure bell suited to grass-grounds, and to such arable lands as are to be hewed, as turnips, cabbages, carrots, potatoes, beans, &c. as these weeds will in a great measure be destroyed by good hoeing, or a proper attention to the after culture of the crops. And the earth or mud gathered from the bottom of ditches is excellent for composts. It is usually the lightest part of the soil, carried thither by water, and frequently contains a large proportion of vegetable matter. To this may be added, the cleanings of yards, especially where they are laid with lime. One of the bell materials for composts is peat-earth: this fills up the pores of a sandy or gravelly soil, without diminishing its friabillity. Even when applied by itself to such soil, peat increases its fertility. In a hard clay soil, it should be fermented with lime or dung, or both, and frequently turned, to make it mix properly. Without this precaution it dries, hardens, and cannot be afterwards properly mixed and incorporated with the soil. With regard to the making of composts, if only one fort of manure be used, it is only necessary to put the manure and earth into alternate layers, in a long ridge, and top it so that the rain may not wash through it. When both lime and dung are used, a layer of earth should be interposed between every two beds of lime and dung; for lime, if mixed with dung in the full stage of its putrefaction, corrodes and dissipates its effluvia. After the first fermentation of the dung is completed, the whole should be turned, to mix the ingredients; and this operation should be repeated until the mass shall be sufficiently pulverized; which is done by cutting the compost with a spade in perpendicular stiles. All the weeds should be collected from the neighbouring fields, before they run to seed, and mixed with the compost. The weeds also that grow upon it should be buried down in it. Such kinds of composts may be used for any crop, and when sufficiently pulverized, are excellent for a top dressing to pastures; the parts being gradually crumbled down, and beaten into the soil by the feet of cattle, or washed in by rains. Some are of opinion, that no advantage results from mixing dung with earth; a bottom of earth, however, must always be useful to retain the moisture that flows from the dung. Quicklime mixed with the dung is useful, by keeping the manure in a proper state, and preventing the putrefaction from proceeding to too great a length. It has been observed, that making compost dunghills is a general practice in Norfolk. The principal source of them is the flowerings of ditches, which are found there to be fragularly fertile. It is not the sediment of water from the inclosures, but it contains entirely of dead weeds, leaves of the hedge, and the mouldering of the bank and files of the ditch. The most barren sub-lfratum, exposed a few years in the face of a ditch bank, is frequently changed into a rich black mould. Perhaps the sea air, acting upon a loose porous foil, may afford in producing this change. Other flowerings of manure are useful, the backs of ditches, the borders of fences in general, the sides of lanes, the nooks of yards, and which, in many places, are covered to remain the nursery of weeds. These are turned up into ridges, to root the roots of the grasses and weeds, and to receive the menstruation of the air; which done, they are carted in due feation to the dunghill, to be well incorporated with that subliration. It is stated as a good and economical mode of raising a large quantity of compost manure, to bed the farm-yard about two feet deep with earth, and on this cleanse the flables, cow-houses, hog-huts, &c. and to move the cribs in which loose cattle are fed, with straw about it. This bed of earth will retain the urine, so that, when the whole is mixed together, it will all be nearly of equal goodness, and admirably adapted to gravelly and loofe foils in general, through which the essence of dung always escapes, as well, as in one season; and a top dressing of loofe, pigeons' dung, &c. would last but one crop, and very rotten pure dung would be little better. Having the drains from the flables, cow-hinds, and other offices, made so as to discharge themselves into places where these different sorts of earthy materials are depolitated, might be a cheap and expedients method of procuring good compost-manure. And another good method of raising compost dunghills is by making them into clamps. Make a layer of hedge earth from a grubbed border, two feet deep, and about twelve feet square, in the beginning of November; the quantity of earth will be about twenty-six loads of six tons or bushels each; on this clean all the yards and heds. The yard not being bedded with earth, should be well littered, to soak up the urine, and to be made into dung by the hogs and loose cattle; this may be cleared once or twice a week, and the heds once a week, and piled regularly on the foundation of earth, until the heap is about seven feet high; and when one clamp is thus filled up, another foundation of earth may be laid adjoining to it. In order to enrich the compost, the flowings of the wheaf should be prevented from running off, and thrown upon occasionally on it. By thus pluming the compost in clamps, it will be in very good order for arable land early in the spring; which will not be the case if it be left to be trodden flat over the
the whole yard, and every particle washed by the rain. Fermentation goes on much quicker in this method; and it would be better still if the heap were made under a roof, to keep off all water but what is thrown up. Another advantage of this method is, that any part of the compost may be used, by taking a division of the hill that has been the longest finished, and is consequent in the most suitable state for application. See Duo.

It is found that all sorts of animal substances, mixed with earth, litter, or any vegetable material, make a rich compost. Sawdust, mixed with the blood and oil of a slaughter-house, and incorporated till the whole becomes a mouldy mass, is a rich compost. Two loads of it, with three loads of earth, will be sufficient for an acre of wheat or spring corn. Being a kind of top dressing, it should be put on at the time of sowing, and harrowed in with the grain. This kind of manure is best adapted to lands of an open texture. Tough clays require lime, and plenty of dung, to break the cohesion of their parts. As this compost takes up little room, it is very convenient for the use of such farmers as are obliged to bring manures from a distance: it is also extremely rich, and will probably continue longer in the land than yard or stable dung. All animal substances being of the same nature, the refuse of whale-fish, after the oil is boiled out, will make a rich compost with fresh dung, which will reduce the blubber speedily into a putrid flake, or with earth and dung. Having marked out the length and breadth of your intended dung-hill, make a layer of earth, such as moor earth, or that of ant-hills, about a foot in thickness; over this put a layer of yard or stable dung of the same thickness, then a layer of blubber, and over that another layer of dung. Repeat the operation till the heap be raised about six feet, then give it a thick covering of earth, and coat the heap with sods. In about a month, turn the whole in the usual manner; and when turned, coat with earth as before; to confine the putrid flake. In a month or two, the heap will be considerably fallen, when it should have a second turning. This operation must be repeated at proper intervals, till the whole becomes an uniform putrid mass. In general, this compost should not be used till it is a year old. The heap must be guarded from dogs, swine, &c. This compost may with great advantage be applied to all purposes where good rotten dung is required. It is excellent for cabbages and for meadow ground. One hoghead of whale refuse will make eight loads of dung: and must be of great importance to such farmers as lie at a distance from manure, but within reach of those places where train oil is prepared. The practice of throwing this kind of offal into the sea was highly wrong and inconsiderate. And it is obvious, that the refuse of all sorts of fish, and fish itself, when in haws too great for consummation in the way of food, may advantageously be made into a compost in the way above described. These are local advantages; and are mentioned principally with a view to put farmers upon searching diligently for such substances as are within their reach, that are capable of assisting the sheepfold and common dung-hill, upon which in many places they rely wholly, however inadequate to their wants; abundance of good manure properly managed, being the life and soul of husbandry. Where there is a deficiency of materials for making good composts, proper for the soil in many cases, a mixture of different soils may answer the purpose. Thus, where clay predominates, the addition of sand, where it is happily within reach, is often sufficient to ensure fertility: and where sand prevails, the addition of clay or chalk will answer the same purpose. Gravel enriches peat-moss; and that in return improves gravel. The farmer should, therefore, search everywhere above ground and below, for such substances as may improve his several soils, by being properly mixed with them.

In considering the nature of manures, and the methods of applying them to lands, under different circumstances, further directions will be given in regard to the making and applying of composts. See Manure.

COMPOSTELLA, or St. Jago de Compostella, in Geography, a city of Spain, and capital of the province of Galicia, with an archbishop's see and an university, situated in a peninsula formed by the rivers Tambre and Ulla. N lat. 42° 34'. W. long. 7° 17'. It has a great number of nunneries and monasteries, and contains about 3000 houses. The public squares, the churches, and particularly the cathedral, are magnificent. The Spanish military order of St. Jago derives its origin from this place, where the body of St. James is reputed to be buried, which circumstance likewise is to draw a vast concourse of pilgrims from most parts of Christendom in former times.

The number of pilgrims who went thither from England in 1428, amounted to 916 persons: in 1433 the number was 5201 in 1434, 2460, and in 1445, 2100. It was the practice for the crown to grant licences to matters of ships for carrying out a limited number of these votaries of superstition, who took with them considerable sums of money, not only for their necessary expenses, but for offerings and other charges incurred by this pilgrimage. See St. Jago.

Compostella Nueva, or New Compostella, a rich town of North America, in Old Mexico, or New Spain, in the province of Xalio, built by Nuño de Guzmán in 1531, near the South sea; 400 miles N.W. of Mexico. The soil is barren and the air infurbrious; but it has several mines of silver at St. Pequeno, in its neighbourhood. N lat. 24° 10'. W. long. 115° 13'.

COMPOND, the result or effect of a composition of different things; or that which arises from them.

Strictly speaking, every new compound does not produce a new compound; but only that from which a new essence arises. Thus, when one drop of water is added to another, there does not arise a new physical compound; the essence being the same now as before the union.

Compound differs from complex, and flanks opposed to simplex, which see respectively.

COMPOND, in Botany, applied to leaves, expresses their being compound of more than one piece, or leaflet, connected by a common footstalk, which is either simple or branched. Folium decompostum is applied to a leaf more than once compound, and supri-decompostum to any greater degree of such conformation. See Leaf.

A compound flower is limited by Linnæus to that particular kind of aggregate flower, (see Aggregate) whose florets are sessile on a common receptacle, within a common calyx, and furnished with anthers united into a tube. These are the exclusive characters of the great natural clafs fyngeta, the 19th in the Linnæan System, the last order of that clafs, menaginis, consisting of simple flowers, being now, by general consent, put a class. Compound flowers consist either of uniform perfect florets, each furnished with filaments and pistils, and all ripening perfect seed; or of such florets in the disk, with female, or even neutral, ones in the radius; or, finally, of male florets in the disk and female florets in the radius. Their partial corollas are either tubular and five-leaf, or ligulate, drop-shaped. Their manner of becoming double is for the tubular and perfect florets of the radius to become ligulate and female only, or even neutral, which change is often extended to all the florets, even to the centre, in which case no seed is formed. Sometimes the ligulate florets become not only abortive, but tubular,
tubular, or quilled. The prevailing colour of compound flowers is yellow, especially their disk. The ligulate radius is often white, red, or blue, with a yellow disk, but if the radius be yellow, the disk is never of any other colour, except what arises from the anthers or ligular.

Compound Port. Forms, Puffils, Fractions, Fracture, Glund, Harmony. See the substantives.

Compound interest, called also interest upon interest, is that which is reckoned not only upon the principal, but upon the interest itself forborn; which hereby becomes a sort of secondary principal. See Interest.

Compound Larceny. See Larceny.

Compound Machine, Machinery. See the substantives.

Compound motion, that motion which is effected by several conspiring powers.

Powers are said to confpire, if the direction of the one be not directly opposite to that of the other; as when the radius of a circle is conceived to revolve about a centre; and at the same time a point to move straight along it.

All curvilinear motion is compound.

It is a popular theorem, in Mechanics, that in an uniform compound motion, the velocity produced by the conspiring powers, is to that of either of the powers separately, as the diagonal of a parallelogram, according to the direction of whose sides they act separately, to either of the sides. See Composition of motion.

Compound numbers. See Composite.

Compound proportion, in Mechanics, that which consists of several weights constantly keeping the same distance, both from each other, and from the centre about which they oscillate. See Pendulum.

Compound proposition. See Proposition.

Compound quantities, in Algebra, are such as are connected together by the signs $+$ and $-$: thus, $a + b - c$, and $bb - b$ are compound quantities.

Compound ratio is that which the product of the antecedents of two or more ratios has to the product of their consequents. Thus $6 \cdot 72$ is a ratio compounded of $2$ to $6$, and $3$ to $12$. See Proportion and Composition of ratios.

Compound Sounds, Sord, Tofe, Ulcer, Words. See the substantives.

Compound flops on an organ, are such wherein each finger-key acts upon two, three, four, or even five pipes of different pitches, and causeth them all to sound together, whenever a key in this flop is put down. The most common of these are the Cornet, the Sesquialter, and the Mixture, or Furniture flops. (See these articles:) the use of these compound flops with others which are not tuned to the actual note which they represent, or that on the diapason flop, but to the XIIth or XVIth thereof (See Twelfth, Tiers, and Largo, Stop,) is to introduce an inconceivable number of actual discords into the common chord, even during full performances, as any person may, at leisure, satisfy himself by writing down the several notes produced by a chord formed of the flops above-mentioned, combined with the diapason and other unisonant flops, or by putting down all the keys on a piano-forte at the same time, to which a chord on these flops succurs. No problem in the science of harmonics is more difficult of solution, than to account for the ear's receiving pleasure from such a confused and dissonant afflembly of sounds: and it can only perhaps be accounted for by supposing, that the concordant notes being so many more in number in these kinds of chords, overpower and drown the dissonants to such a degree, that the ear is able by a sort of mental exertion to pass over and not attend to the latter, any more than to the rattling of the keys of a badly constructed harpsichord, or the noise of carriages in the street adjoining a concert-room, &c.

COMPOUNDED IDEA, in Logic, notes several ideas of a different kind, which are usually considered as distinct single beings, whether these united ideas be simple or complex. See Collective idea.

COMPOUNDING Felony, in Law. See Theft, Bote.

COMPOUNDING of informations upon penal statutes, is an offence of an equivalent nature to CHAMPION in criminal cases; and, besides, it is an additional misdemeanour against public justice, by contributing to make the laws odious to the people. At once therefore to discourage malicious informers, and to provide that offences, when once discovered, shall be duly prosecuted, it is enacted by statute 3 Eliz. c. 5, that if any person, informing under pretence of any penal law, makes any composition without leave of the court, or takes any money or promise from the defendant to excuse him, (which demonstrates his intent in commencing the prosecution to be merely to serve his own ends, and not for the public good,) he shall forfeit 10/s., shall stand two hours on the pillory, and shall be for ever disabled to sue on any popular or penal statute.

COMPREHENSION, in English Church History, denotes a scheme propounded by Dr. Orlando Bridgman in 1667-8, for relaxing the terms of conformity in behalf of protestant dissenters, and admitting them into the communion of the church. A bill for this purpose was drawn up by lord chief baron Hale, but disallowed. A project to the same purpose was proposed and argued in parliament soon after the restoration, in 1661; but the royalists and zealous churchmen formed a majority, and the endeavours of those who wished to avail themselves of the king's declaration to this effect, proved ineffectual. The attempt was renewed by Tillootson and Sibbling in 1674, and the terms were settled to the satisfaction of the non-conformists, but the bishops refused their assent. This scheme was likewise revived again immediately after the Revolution; the king and queen expressed their desire of an union: however the design failed after two attempts; and the act of Toleration was obtained. Birch's Life of Tillotson, p. 49, 167, &c.

COMPREHENSION, in Metaphysics, is that act of the mind, whereby it apprehends, or knows, any object presented to it, on all the sides, wherein it is capable of being apprehended, or known.

To comprehend a thing, is defined by the schoolmen, comprehendo; totum & totaliter cognovisse. See Apprehension.

COMPREHENSION, in Rhetoric, a trope, or figure, whereby the name of a whole is put for a part, or that of a part for a whole; or a definite number of any thing for an indefinite.

COMPREIGNAC, in Geography, a town of France, in the department of the Upper Vienne, and district of Bellac; 10 miles N. of Limoges.

COMPRESS, in Surgery, from the Latin word comprimere, to press together, is a bolster of linen cloth folded several times, and employed on various occasions.

Compresses are formed sometimes of lint or surgeon's tow, but more commonly of half-worn linen without seam or selvage. The fize, thickness, and form of them, must be regulated by the part to which they are applied, or the object which the surgeon has in view.

When they are intended to cover other dressings to a wound, &c, they must be always larger than the subjacent plasters, and must lie upon the part in an equal and even manner,
manière, so as to retain the dressings deadly on the affected part.

Compresses are divided into simple and graduated. A
simple compress consists of linen or flannel folded from two
to eight times; and are made quadrangular, triangular, or
with pieces cut off a square at the corners, so as to give the
compress a crucial form, &c. A graduated compress con-
ists in a number of simple ones laid one above the other,
and sometimes sewed together in the shape of a pyramid;
these latter are used for compressing a bleeding artery, or
they are applied to the bottom of a fistulous sore, or to the
siders of a deep fleshly wound, or upon ganglions, and some
other tumours, in order to disperse them.

Compresses are employed to fill up inequalities, or hollow
parts of the body; they are also used to guard wounds under
the contact of irritating substanances, and sometimes
merely to receive the purulent discharge. They are fre-
cently moistened with different medicated fluids, and are
applied either warm or cold according to the surgeon's
intention.

Compresses are sometimes of considerable length, and of
little breadth, especially when employed to the extremities
of the body in a circular form, after the manner of common
bandages. (See BANDAGE.) The latter kind of bandage is
named by the French longuette. The methodical applica-
tion of such compresses has effected a cure in some aneu-
rism: they are also found particularly useful in fistulours
and deep sore, where matter is apt to collect and require
counter openings. From the various natures of compresses,
writers have named them extensile, uniting, diverfive, &c.

Tourinquet, trifles, and some other surgical instruments,
are only particular kinds of compresses. (See ANEURISM,
and HERNIA.) Compression is now and then made very
advantageously by means of the finger only, and will often
stop a violent bleeding in parts where no surgical apparatus
can be employed. Thus the root of the nose is comprized
with the fingers, in order to stop violent bleeding, and the
crown of the teeth in order to relieve the tooth-ache; and
in order to make polypi suppurate, platulate, or fall-off,
their roots are comprized between the fingers. A great
number of the bandages that are used, produce their ef-
teys merely by the support which they give to the parts.

The diversity of cafes in which a skilful surgeon will em-
ploy compression with advantage, cannot here be detailed;
but in addition to what has already been said, we may add
that by this means alone; drophical swellings may frequently
be dissipat; and of this, Mr. John Bell records a striking
example in his "Principles of Surgery," 4to. vol. i. p. 128,
where he treats of bandages in general. By the way, we
may mention, that Mr. John Bell has here given some ex-
cellent general observations; but (as in other parts of his
writings) he affects to have read in authors what one
elle can find; and in the influence before us, he pretends to
have read the treatises of Soranus, Galenus, and Dioscorid,
in which," he says, "I find nothing but what has fallen
into deferred neglect;" whereas these authors have not
written any treatises upon bandages that have descended
to the present generation! Well might this author ask the
question, "Why should we go back to the ancients in this
pitiful manner?"

Compressed Fossilis, this term is applied by naturalists to
various extraneous substances found in the earth, which
seem to have suffered a flattening or change of shape, from
the weight of the superincumbent strata; this is not un-
common with fossil shells, of large size compared with their
thicknes, as echini, &c., and should be particularly noted
in describing the circumstances of any stratum, where such
compressed fossilis appear.

The mountains of Quediack and Portfallet in Norway,
contain an argillaceous pudding-stone, the silicious pebbles
of which have been thought by some to be compressed, becau-
s these in the lower part of the stratum are progresively thin-
er than those above (Kirwan's Geo. Exp. 3.); but this
probably was their original shape. The small black chert
pebbles, which form uniform layers in the lower part of the
London clay stratum, are all of them somewhat flat, but
certainly not by compression, we think.

Bituminized wood, or the resemblance of trunks of trees
in wood-coal, is often found flattened, as at Todi, and near
Aquap-Sparis in Umbria, at Thun in Switzerland, in Ice-land, &c. Silicious petrifications have frequently some-
what the appearance of compressed wood, and have been so de-
nominated: but a careful examination of several specimens,
in which the transverse section presented two equal seg-
ments of circles joined together by their chords, instead of a dilat-
ed ellipse, which would probably be the form of round
wood when compressed, has induced us to think that these,
and probably many extraneous fossilis said to be comprized,
may originally not have been round.

Peat-fossilis of the present race, such as the trees found
in the sea at Sutton in Lincolnshire, and in other places,
have without doubt been flattened, by the weight of peat
and earth lying upon them, when in a soft and decaying
state.

COMPRESSION, from the Latin compressio, is the act
of pressing, or squeezing matter together, so as to force
its parts nearer to one another, and enable the whole to oc-
cupy a smaller space; or the effect produced by that cause.
Compression and condensation denote the production of
the same effect; that is, the reduction of a certain quantity
of matter into a smaller space; with this difference, howev-
er, that when the effect is produced by the application of
any external force, as by the pressure of a superincumbent
fluid, or by means of mechanical engines, it is more propo-
denomination compression; but when the effect is produced
by some internal action, as by the escape of caloric in cooling,
it is then called Condensation, which see.

Compression takes place in various natural processes,
and it is also practiced by art for various mechanical and eca-
onomical purposes. The inquiries which may be made con-
erning it, are, 1st, the principal cafes in which compression
is produced in nature; 2dly, the mechanical methods which
are used for compressing bodies in manufactories and in civil
economy; and 3dly, the principal effects which result there-
from. Of the natural compressions, those which arise from
the weights of superincumbent folids are sufficiently obvious,
and they will, besides, be particularly examined under the
articles Gravity, and Mechanics; but those which are
occasioned by fluids, being much less evident, are seldom
sufficiently understood even by those who are concerned
with them.

Water and air are the two fluids with which mankind is
naturally and unavoidably concerned; and the presurres
of those fluids differ materially from each other. The pre-
sure of water is proportionate to its perpendicular height and
not to its quantity, and that pressure is exerted in every di-
rection; for influence, let two vessels of the same height, but
of different sizes, as a small pipe and a large reeyer, be
filled with water to the same height; then if you measure
a square inch in the bottom of the small pipe, and a square
inch in the bottom of the reeyer, the pressure upon those
two different square inches is the same; though the refer-

may
may contain twenty or thirty thousand times more water than the pipe. Also, if you take a square inch on the side of the vessel close to the bottom, the lateral pressure upon it will be equal to the pressure on the square inch of the bottom; excepting indeed a trifling difference which arises from the perpendicular height of the water above the latter, which barely exceeds the perpendicular height of the water above the former.

But though water presses upon every body that is immersed in it in proportion to its perpendicular height, and tends to force the parts of those bodies closer to each other, provided that those bodies have not pores large enough to admit the water; yet water is not itself susceptible of compression, and, though a very slight, and scarcely perceptible degree; hence at different depths, water is nearly, if not exactly, of the same density.

The air of the atmosphere, as well as the other aerial fluids, is highly elastic, in consequence of which it only presses upon all bodies that are immersed in it; but, by pressing upon itself, its own density is rendered different at different altitudes. The bulk of a given quantity of air has been found to decrease in the direct ratio of the force with which it is compressed; hence it has been demonstrated, that if the altitudes above the surface of the earth be taken in arithmetical progression, the densities of those altitudes will be in geometrical progression decreasing. If a very long tube, closed at one end be filled with water, and then be inverted in a basin of water, that fluid will remain suspended in it to the height of about 33 feet, that weight of water being counterpoised by the pressure of the atmosphere; (see the articles Atmosphere, Pneumatics, and Hydrostatics.) Therefore, since a man on the surface of the earth is pressed by the weight of the atmosphere, if he places himself at 33 feet below the surface of the water, he will be pressed by twice the above-mentioned weight of the atmosphere; if he places himself at 66 feet below the surface of the water, he will sustain a pressure equal to three atmospheres, and so on.

If the above-mentioned experiment be tried with a tube filled with and inverted in a cup of quicksilver, instead of water, it will be found that the quicksilver will remain suspended in it to the height of about 30 inches, the specific gravity of quicksilver being much greater than that of water. As the pressure of the atmosphere counterpoises a perpendicular pillar of quicksilver about 30 inches high, or more accurately speaking, between 28 and 31 inches; for it varies between those limits (see Barometer); the weight of such a pillar, let its base be what it may, shows the pressure of the atmosphere upon a surface equal to that base. A pillar of quicksilver, whose base is an inch square, and whose altitude is a mean between 28 and 31 inches, weighs 144 pounds, avoidoposite; therefore, at a mean, the pressure of the atmosphere upon every square inch of the surface of the earth, is equal to 144 pounds; and by the rule of proportion, or by simple multiplication, we may determine the weight of the atmosphere upon any other given surface. Thus the pressure of the atmosphere on a square foot, (which is equal to 144 square inches) is 2268 pounds. The pressure on the body of a middle-sized man, whose surface is equal to about 12 square feet, is 27216 pounds; and the pressure on the surface of the whole earth is equal to about 11043085440000000000 pounds. For further explanation of the mechanical properties of fluids in general, see the articles referred to above, and likewise the article Elasticity.

The artificial methods of compressing substances, either solid or fluid, as employed in the arts, and for economical purposes, are very numerous; different compressing instru-

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Mr. Canton was of opinion that the above-mentioned diminution of bulk under the receiver of the condensing engine, is not to be attributed to any air contained in the water, or any of the other fluids; because when Mr. Saffuré performed the experiment with water which had been boiled to inhibit more than an usual quantity of air, the compression did not appear to be greater. Yet it may be observed, that considering the flight degree of compression which water is capable of, and the difficulty of depriving water entirely of air, one might be induced to doubt whether that compression is not to be attributed to the air. See Canton's account of those experiments in the 52d and 53d vol. of the Philosophical Transactions.

With respect to the effects produced by compression, it is in the first place to be remarked, that certain bodies, when prefl'd, suffer a derangement of form; but as soon as the pressure is removed, they recover their former shape. Those bodies are said to be elastic, and they are distinguished into perfectly elastic, when they recover their former bulk and shape entirely, as the caife with common air, and imperfectly elastic, when they recover their former shape only in part; which is the caife with for the greatest number of bodies.

When the bulk of a body is reduced by compression, the specific gravity of that body is proportionately increased; thus the specific gravity of fine gold, that has been fused only, is 19,253; but the specific gravity of the same, after having been hammered, is 19,562. The specific gravity of pure silver, that has only been fused, is 10,471; that of the same hammered, 12,514. The specific gravity of copper, simply fused, is 7,738; that of the same hammered, is 8,978, and so forth.

Whenever the bulk of a body, and especially of a metallic one, is diminished in bulk by hammering, flattening between rollers, or by any other sort of compression, its hardness or rigidity is increased at the same time; thus soft brass, or silver, or copper, by hammering, or prefling, is rendered hard and elastic. By the application of a degree of heat, somewhat lower than incandescence, that hardness or elasticity of the metal is removed, and at the same time its specific gravity becomes equal to what it was before the hammering. This process is called annealing or softening.

The other remarkable effects of pressure may be reduced to three; namely, a modification of the action of the same degree of heat on bodies, an extirpation of heat, and an extirpation of light. When heat is applied to any body, the effects differ according as the application takes place under different atmospheric preflures. On the tops of mountains, where the prefluence of the atmosphere is considerably less than it is on the level of the sea (in confluence of which the quicksilver does not stand so high in the barometer as it does in the latter), water boils at a lower temperature; and so do other fluids. At the level of the sea, water boils at about the temperature of 212° of Fahrenheit's thermometer; but Mr. Saffuré found on Mont Blanc, which is reckoned the highest mountain of any in Europe; where the barometer stood at 17.05 English inches, that the heat of boiling was 165°.

From the experiments of Sir George Stubbkirk, and of Mr. De Lin, the following table of the heats of water boiling under different preflures of the atmosphere, which are indicated by the altitudes of the mercury in the barometer, was calculated by Mr. Kirwan.

<table>
<thead>
<tr>
<th>Barometer</th>
<th>Heat 1</th>
<th>Barometer</th>
<th>Heat 2</th>
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<tbody>
<tr>
<td>20</td>
<td>217</td>
<td>21</td>
<td>195.56</td>
</tr>
<tr>
<td>29</td>
<td>210.28</td>
<td>20</td>
<td>197.36</td>
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<td>28</td>
<td>238.52</td>
<td>19</td>
<td>191.66</td>
</tr>
<tr>
<td>27</td>
<td>265.75</td>
<td>18</td>
<td>188.46</td>
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<tr>
<td>26</td>
<td>254.91</td>
<td>17</td>
<td>187.76</td>
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<td>25</td>
<td>253.55</td>
<td>16</td>
<td>184.86</td>
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<tr>
<td>24</td>
<td>251.15</td>
<td>15</td>
<td>180.86</td>
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<tr>
<td>23</td>
<td>248.27</td>
<td>14</td>
<td>176.76</td>
</tr>
<tr>
<td>22</td>
<td>246.71</td>
<td></td>
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</tbody>
</table>

Mr. Watt observed, that in a very good vacuum water boils, or produces copious vapours, even when its heat is not greater than 55°. On the other hand, when water is caused to boil under a great prefluence, a much greater degree of heat must be applied: thus, in Papin's digester (being a strong vessel in which a quantity of water is confined) the water may be rendered nearly red hot; and in that state the dissolving property of water is increased prodigiously. In Ireland a natural discharge of hot water comes out of a deep pit, and when this water falls upon the surface of the earth, it deposits a white powdery fusculent subfance, which, it is supposed, the water was enabled to dissolve by the volcanic heat, that acted upon it under a great degree of compression.

Dr. Hutton, like some other geologists, has ascribed the formation of the various minerals chiefly to the action of subterraneous fires; but he thought that that action was modified by the compression of the superincumbent strata of the earth, which rendered it capable of producing such effects as could not be equally imitated on the surface of the earth; for it seemed to him, that under a great degree of compression, volatility would expose to a high degree of heat such substances as generally fly off in our fires, on the slightest application of heat. Hence, by their chemical relations peculiar combinations might arise; such as are dug from the bowels of the earth. What Dr. Hutton supposed, was in a great measure verified by Sir James Hall, bart., who, by his numerous and well imagined experiments, has shown a variety of remarkable effects, on different substances, by the action of heat modified by compression; but his interesting experiments will be described amongst the effects of heat.

The other two remarkable effects of compression on bodies, are an extirpation of heat and an extirpation of light. These effects having been observed with all those bodies which may be subjected to decisive experiments; it may be presumed from analogy, that the same effects take place in various degrees, with all bodies which are susceptible of compression, but not with those which are not compressible; and, in fact, liquids which are only compressible in the slightest degree imaginable, cannot be heated by agitation, which is friction amongst their particles; and there is no friction without compression. As heat is evolved from a body when compressed, so when the bulk of a body is enlarged, heat is absorbed; in confluence of which the surrounding bodies are cooled; and this absorption of heat seems to be directly proportioned to the enlargement of bulk. The following instances will illustrate the nature of these remarkable effects. The blacksmith, by about twenty strokes of the hammer upon a piece of iron bar not thicker than a man's little finger, can render one extremity of it red-hot, visible in the day light. But it is to be remarked, that the same extremity of the iron bar cannot be rendered red-hot.
red-hot a second time, unless it be previously softened in the fire. The condenfation of common air, quickly performed, produces a considerable degree of heat; so much so, that cotton has been set on fire, and so has heated charcoal, by compressing the air quickly upon it. An ingenious mecha-
nics in Paris is said to have kindled tinder in tubes, or compressing pumps, of about a quarter of an inch in di-
diameter, and six inches in length, by a single blow of the pillow. Steam, also, by mechanical compression, may be made to yield its latent heat. A mixture of oxygen and hydrogen gases, if quickly compressed, takes fire and ex-
plodes with great force. The discharge of an air-gun is at-
tended with a faint flash of light, visible in a darkened room; and the sudden compression of the air in a tube, to the end of which a strong glass is fitted for the purpose of manifesting what passes within, is likewise attended with light.

In explanation of these phenomena, it is supposed, that independent of the specific caloric, peculiar to every body, a quantity of it is lodged in the pores of each body, and that this may be extricated by compression, in the same manner as water is squeezed out of a sponge. But a far-
ther examination of facts will throw more light upon the subject.

It is well known, that friction amongst solids generates heat, which often occasions actual inflammation and com-
bustion. Thus the axles of wheels of carriages, and other machines, are sometimes set on fire by the violence of the friction; thus, in a turning lathe, the pieces of work are heated to a great degree; thus, the violent collifion of a steel against a flint, renders the abraded particles of the former perfectly red-hot. Count Rumford, willing to in-
vestigate the origin of the heat produced by means of fric-
tion, instituted an interefling series of experiments in the workshops of the military arsenal at Munich, where cannons are bored; in which cases a degree of heat far exceeding that of boiling water, is produced. After having examined the temperature of the metallic shavings, their quantity, capac-
ity for containing caloric, &c., and finding reasons sufficient to account for the production of that remarkable quantity of heat which was manifefted in the course of the boring, he began to consider which way that heat might be derived, whether from the contiguous metal or from the air, and in order to determine the matter by means of actual experi-
ment, he contrived a suitable apparatus, the principal part of which was intended to turn a piece of metal in a box full of water, whilst a blunt borer acted forcibly against it, so as to produce a considerable degree of friction, without abrating from the piece of metal more than an inconsider-
able quantity of it in a feally powdery flate. With this ap-
paratus, in which both the piece of metal and the borer were plunged in water of the temperature of the atmos-
phere, no heat could be derived from the air. The ma-
chine which turned the piece of metal being put in motion, the water in the box, &c., began to be heated soon after, and in 2½ hours time, from the commencement of the operation, the water actually boiled. The result of this experiment showed, that the heat, which had caused the water to boil, was not derived from the air, and from computation it appeared, that the abraded metallic powders could not furnish it in confequence of the change of their capacity. "Is it possible," quoth Rumford, "that the heat could have been supplied by means of the iron bar, to the end of which the blunt borer was fixed? or by the small neck of gun-metal by which the hollow cylinder was united to the cannon?" "These suppositions appear more improbable even than either of those before-mentioned; for heat was con-
tinually going off, or out of the machinery, by both these
passages, during the whole time the experiment lasted. And in reasoning on this subject, we must not forget to con-
consider that most remarkable circumstance, that the source of the heat generated by friction, in these experiments, ap-
purred evidently to be inexhaustible. It is hardly necessary to add, that any thing which any inflated body, or system of bodies, can continue to furnish without limitation, cannot possibly be a material substance; and it appears to me to be extremely difficult, if not quite impossible, to form any distinct idea of any thing, capable of being excited and communicated in the manner the heat was excited and communicated in these experiments, except in motion." Phil. Tran. for the year 1798.

It seems strange that so distinguished a philofopher as Count Rumford should be induced to admit the immaterial-
ity of heat from the refult of the above-mentioned exper-
iment, without advertifing to the compreflion which the metal muff have received from the action of the borer.

Having mentioned the principal effects which arise from compreflion, amongst which the extrication of heat has been reckoned the moft interefling; we might now State feveral in-
stances of the contrary effect, namely, of the abforption of heat attending the enlargement of bulk which takes place in feveral bodies after the removal of the caufe which occasioned their compreflion. With refpect to this, how-
ever, we need not be very profic in this place. The hy-
draulic engine at Scheffmuth furnifhes a ftrong inftance of the latter effect. That engine operates by cauing a fall of water to comprefs air in a strong vefsel, the re-action of which forces other water to rife in another pipe Tor certain purpofes. Now, in confequence of the great height of the fupercintendent column of water, the air in the air-vefvel of this machine, is very much comprefled, and it is faid that if the flop cock of this vefvel is opened, the air, in ruth-
ing out of it and expafsing itself, absorbs fo much heat, and, of course, cools the adjacent bodies fo much, as to pro-
duce a copious deposition of moisture from the atmos-
phere, and the actual formation of ice upon the flop cock. The cold produced by the evaporation of water, and es-
cially by that of fpirituous liquors, might be likewise ad-
duced as inftances of the above-mentioned property.

But the farther investigation of these latter phenomena belongs to other branches of natural philofophy, which will be ex-
plained in other places.

The term compreflion, in astronomy and geography, has often been used to denote that diminution of the curvature of the surface of the earth, which has been observed about the poles, as if the earth had been comprefled at the poles by some external forces, which caused it to lose its perfect sphericall form, and to assume nearly that of an oblate spheroid; it being, however, well known that the spheroi-
dal figure arifes from the centripetal force of the parts dif-
tant from the poles, which is likewise the cafe with the other planets. The precise quantity of deviation of the polar regions from the earth from the sphericall form, or the difference between the equatorial and polar diameters, has been variously flated by different astronomers. Sir Iaff Newton, following the defity of the earth to be uniform, has assigned $\frac{1}{2}$ for the difference of the above-mentioned two diameters. Duchess, taking a mean of all the dif-
f erent measurements, found the difference of the two dia-
meters equal to $\frac{1}{2}$ or $\frac{1}{4}$ of the earth's diameter. From other measurements and calcula-
tions made by other able mathematicians, this dif-
ference has been reckoned equal to $\frac{1}{2}$ or $\frac{1}{4}$ of the earth's diameter by De la Lande; to $\frac{1}{4}$ or $\frac{1}{4}$ by De la Place; to $\frac{1}{4}$ by Sejour; to $\frac{1}{4}$ by a late anonymous writer. These latter results agree pretty well with the lengths of the pendulums, which have been
been found to vibrate seconds in different latitudes; so that upon the whole, or a fraction not much differing from this, seems to be the nearest to the true difference of diameters; and the disagreement between the different measurements probably arises from the imperfection of instruments, from the partial attraction of mountains, and from the unequal density of the earth. See professor Playfair's paper on the figure of the earth, in the Transactions of the R. Society of Edinburgh, vol. v. p. 1.

Compression, in Surgery, not only signifies the act of compression, but denotes a class of dilataions produced by the pressure of an extraneous body; and, in some cases, a compression will cause the most serious consequences. For example, compression of the brain, arising from a fracture of the cranium, and a portion of the brain in a depressed state, may occasion inflammation, concussion, and destruction of that part of the brain to which the mechanical effect is applied; which will be more or less, attended by comatose symptoms, and privation of sense or voluntary motion. In such cases, the surgeon endeavors to remove the cause, by elevating the edge of the bone, or extricating it entirely, either with or without trepanning, as the circumstances may indicate. (See Trepanning and Trephining.)

When the symptoms of a compressed brain are evidently marked, no time ought to be lost in setting about an examination of the state of the cranium, wherever appearances point out, or even lead us to conjecture, in what part a fracture may be situated. For this purpose an incision is to be made upon the spot through the integuments to the surface of the bone, which must be sufficiently exposed to admit of a free examination. Some authors have recommended a crucial incision; others, one in form of the letter T; while many advise a considerable part of the integuments to be entirely removed. But as it is more agreeable to the present mode of practice to have as much of the skull as possible, a simple incision is generally preferred, unless the fracture runs in different directions, and then the incision must vary accordingly. It will frequently happen, that a considerable part of the integuments must be separated from the skull, in order to obtain a distinct view of the full extent of the fracture; but no part of the integuments is to be entirely removed. When blood-vessels of any considerable size are divided, either before or at the time of the examination, they ought to be allowed to bleed freely, as in no case whatever is the least of blood attended with more advantage than the present. When, however, it appears that the patient has lost a sufficient quantity, the veins ought to be secured.

After the integuments have been divided, if the skull be found to be fractured and depressed, the nature of the case is rendered evident; but even where there is no external appearance of fracture, tumour, discoloration, or other injury; if the patient continue to labour under symptoms of a compressed brain, if the pia mater has been separated from the bone, and especially if the bone has lost its natural appearance, and has acquired a pale white or dusky yellow tinge, the trepan ought to be applied without hesitation, at the place where these appearances mark the principal seat of the injury. Again, although no mark, either of fracture or of any osseous underneath, should appear on the outer table of the bone, yet there is a possibility that the inner table may be fractured and depressed. This indeed is not a common occurrence, but it happens perhaps more frequently than surgeons have been aware of; and where it does happen, the injury done to the brain is as great, and attended with as much danger, as where the whole thick youths of the bone is beaten in. The application of the trepan is therefore usually deemed a necessary measure.

But if after the application of the trepan, it happens that no mark of injury appears either on the outer or inner table in that part, or in the dura mater below it, and that the symptoms of a compressed brain still continue, a fracture in some other part is to be suspected; or that kind of fracture termed by practitioners counter-fracture, where the skull is fractured and sometimes depressed on the opposite side to, or at a distance from, the part where the injury was received. This is not in most cases a frequent occurrence, and has even been doubted by some; but different instances of it have, beyond all question, been found. If therefore the operation of the trepan has been performed, and no fracture is discovered, no extravasation appears on the surface of the brain; and if blood-letting and other means usually employed do not remove the symptoms of compression, the operator is to search for a fracture on some other part. The whole head should again be examined with much accuracy; and, by probing deliberately but firmly over every part of it, if the smallest degree of sensibility remains, the patient will show signs of pain, either by moans or by raising his hands, when pressure is made over the fractured part. In this way, fractures have been frequently detected, which might otherwise have been concealed.

Having here considered every thing preparatory to the operation of the trepan, we shall point out the means best adapted for the removal or elevation of a depressed portion of the bone, by the use of that instrument, under the article Trepan. After the operation, the patient should be placed in as easy a position, in bed, as possible, with his head and shoulders elevated a little more than vertical. If the operation be attended with fevers, he will begin from the signs of increasing sensibility and the original head symptoms will gradually disappear. In this state, he ought to be kept as quiet as possible; proper laxatives being occasionally administered, and such as may be kept of a nauseating nature. His food ought to be simple and easy of digestion, and his drink of the most dihtent kind. If he complain of the wound being unseasy, an emollient poultice should be immediately applied, and renewed three or four times in the twenty four hours. By taste means there will commonly be a free suppuration from the whole surface of the fore.

Every time the wound is dressed, the purulent matter ought to be wiped off from it with a fine warm sponge; and if any degree of floechnesis takes place on the dura mater or parts adjacent, it will then be completely separated. Granulations will begin to form, which will continue to increase till the whole area to a level with the surface of the cranium. The edges of the fore are now to be dressed with some milde cerate, and the rest of it covered with fine lint, kept gently pressed on it by a night-cap properly secured. In this way the cure will go on favourably; luxury of granulations will commonly be prevented; the parts will cicatrize kindly; and as all the skin has been preferred in making the first incision, the cicatrix will be but little observed.

But things do not always proceed in this favourable manner. Sometimes, in a few hours after the operation, the patient is seized with a kind of relightfulness, tending his arms, and endeavouring to move limb by limb, while the symptoms of a compressed brain remain nearly the same as before. In this case, especially if the pulse be quick and strong, the patient ought to be bled freely, as there will be reason to suspect some tendency to inflammation in the brain. Sometimes, though the trepan has been properly applied, the symptoms are not relieved, on account of extravasated fluids collected internally under the dura mater, or between the pia mater and brain, or in the cavity of the ventricles. The danger in these cases will be in proportion to the depth of
the collection. Particular attention, therefore, ought always to be paid, to the state of the dura mater after the perforation has been made. If blood be collected below the dura mater, this membrane will be found teuche, dark eburned, caotic, and even livid; in which case, an opening becomes absolutely necessary to discharge the extravasated fluid. Gentle scratches are to be made with a scalpel, till a probe or directory can be introduced; upon which the membrane is to be sufficiently divided in a longitudinal, or sometimes even in a crucial, direction, till an outlet to the fluid be given.

After the dura mater has been cut in this manner, there is a possibility of the brain protruding at the opening; but the danger from this is not equal to that arising from excited fluids compressing the brain. A troublesome appearance also now and then follows the operation of the trepan; namely, the excreta which are pressed out, and which is a piece of gravel, called fangi (ice fungus), formerly supposed to grow immediately from the surface of the brain, but which, in general, originate from the surface of the dura mater or edge of the bone granulating too luxuriantly. After the wound is cured, only a small crater will remain, and, in general, the parts will be nearly as firm as at first, but when much of the integuments have been separated or destroyed, as they are never re-generated, the wound will be left covered only by a thin cuticle, with some small quantity of cellular substance. When this is the case, the patient usually wears a piece of silver, copper, or tin, properly fitted and lined with flannel, to protect it from the cold and other external injuries.

This is the method now commonly practiced in cases of compression; but it frequently happens, that instead of compression, such a degree of concussion takes place that no assistance from the trepan can be attended with any advantage; for the effects of concussion (see Concussion) are totally different from those of compression, and therefore to be removed in a different manner. In Part III. of his Surgical and Physiological Essays, Mr. Abernethy says, the degree of pressure which the brain can sustain without great injury to the system, probably may vary according to the disposition of that organ to be affected by it, the quality of its application, and the direction in which it is made; and although it must be very difficult to obtain any practical knowledge on this subject, yet there is great reason to believe that the brain can bear more pressure without injury to it than was formerly supposed. The fullness of the cerebrospinal cavities may be a source of great inconvenience. Various means have been used to prevent the excreta from effusing out of the body, and from causing much inconvenience. Where a compressing cause does not, in the least instance, occasion bad effects, if inflammation of the brain ensues, it seems then to act injuriously; which probably arises from the increased susceptibility of the brain. We can rarely judge of the effects of pressure when any part of the cranium is beaten in by a blow; for in that case the shock generally occasions inflammation. Internal hemorrhages, perhaps, afford us the best criterion whereby to determine the effects of pressure on the brain. A case (the seventh) which Mr. Abernethy relates, sufficiently illustrates this remark, for it appears that a considerable hemorrhage must have taken place before it deprived the patient of his faculties; since he walked home, undisturbed himself, and went to bed, after the trunk of the middle artery of the dura mater had been ruptured. In cases of apoplexy, also, the hemorrhage is generally very large, before it produces those consequences which destroy life.

Compress of the brain will sometimes arise from the luxuriant growth of a part of the inner table of the skull, or a small projecting piece of bone, which may have advanced superficially; and it has now and then been discovered that epileptic fits arise from this cause. In apoplexy, the common cause of a compression of the brain is blood or serum. When persons have a palsy of the lower extremities from incrustation of the spine, the paralysis arises from compression made on some part of the spinal marrow by a dislocation of the vertebrae; and nothing can relieve a patient effusively in this case, unless the pressure be removed by extending the spinal column mechanically. (See Curvature of the Spine.)

A dangerous compression may be produced in different parts of the body, by the existence of tumours, by dislocation of the joints, or by fractures, &c. See Tumour, Dislocation, and Fracture.

COMPRESSOR NARIS, or Narium, in Medicine, is a muscle of the nose, described also under the name of constrictor nasi. It arises from the root of the ala nasi, where its fibres are strongly connected with the diaphragm labii superioris et alae nasi, and are also mixed with those of the depressor alae nasi. It proceeds to the dorsum of the nose, and spreads its fibres between the ala and the osseous nasi; they are partly joined with the fibres of the opposite muscle, and partly connected with those of the frontal portion of the fronto-occipitalis. By drawing down the movable part of the ala nasi, and bringing it to the septum, it closes the aperture of the nostrils; in this case the dura-mater alae nasi must concur with it, in order to render the inferior part of the ala fixed. If this latter muscle did not act at the same time, the compressor naris will elevate the lower part of the ala, and thereby expand the naris. Cooper calls it elevator alae nasi: Santorini and Winblad, transversalis nasi.

COMPRESSOR PRESTATA. It seems doubtful whether this should be considered as a distinct muscle, or only as a portion of the levator ani. It arises from the under surface of the arch of the pubis, and is lost between the profunda and rectum. It will therefore have the power of elevating or compressing the former part.

COMPRINT, a surreptitious printing of one bookseller's copy by another person, for gain; which was contrary to common-law and now is under certain limitations, restrained by statute. See Literary Property.

COMPRISE NIENT. See NIENT.

COMPROMISE, a treaty or contract, whereby two contending parties establish one or more arbitrators, to judge of and terminate their differences in an amicable way.

The regular way of appointing a compromise is by a writing, expressing the names of the arbitrators, the power of choosing an umpire, or super-arbitrator, in case of need, a time limited for the arbitration, and a penalty on the party who does not abide by the decision.

By the civil law, a slave cannot make a compromise without the leave of his master, nor can a pupil without the authority of his guardian, or a wife without that of her husband. So a slave, a deaf or dumb man, a minor, and the person who is a party in the cause, are incapable of being chosen arbitrators in a compromise.

The occasions on which a compromise is not allowed of, are restitutions, marriage-causes, criminal affairs, questions of title; and, generally, any thing wherein the public interest is more concerned than that of private persons.

In our law, a compromise is not of so much extent. Well defines it the faculty, or power of pronouncing sentence between persons at controversy, given to arbitrators by the mutual private consent of the parties, without public authority.

Matters
Matters compromised are also matters of law referred, or made an end of. See Arbitration and Arbitration.

Compromise is also used in beneficiary matters; where it signifies an act, whereby those who have the right of election, transfer it to one or more persons, to elect a person capable of the office or dignity.

COMP, in Geography, a small town of France, in the department of the Var, and chief place of a canton in the district of Draguignan; ten miles N. of Draguignan. It contains 3,190 and the canton 2,949 inhabitants. The territory includes 525 kilometres and 0 communes.

COMP, in Geography, a towns of Italy, in Samium, towards the south-east, upon the Appius. At the siege of this city was killed Mico, so well known by Cicero's oration on occasion of his murder of Catilina. See CAMPEA.

COMPATRIOT, a river of Thrace, mentioned by Herodotus, which ran from north to south, and discharged itself into the lake Biflonis, near Abdera.

COMPEL, Lewis, in Biography, a native of Dordrecht, and of the order of Jesuits, went to China in the character of missionary in the year 1635. Upon his return he published "Memoirs of the present State of China," &c., in two vols. As an historian he has been accused of a too great partiality for the charafter and manners of the Chinese, and of attributing to them earlier advances in civilization and improvement than he was warranted by real facts. His work was proscribed, and condemned to the ban, as the most means of refuting his opinions. He died at his native place in the year 1739. Nov. 15, Diet. Hist.

COMPTRE, Nicholas, a French monk, a native of Paris, is known as the author or editor of different works which have been met with a favourable reception. Among others, he published "The remarkable Travels of Peter della Valle, a Roman Gentleman, translated from the Italian, in 4 vols. 4to."—"A new and interesting History of the Kingdoms of Torquay and Laos, in 4 to." translated from the Italian of Father Manni in 1666. In the year preceding this, he published the third volume of his Lewis Coulom's "History of the Jews." He died at Paris in 1689.

COMPTERING, or COUNTING-HOUSE, an office in the king's household, under the direction of the lord steward. As called, because the accounts for all expenses of the king's household are there taken daily by the lord steward, comptroller, cofferer, master of the household, the clerks of the green-cloth, and the clerks comptrollers. They also there provide for the household, and make payments, and orders, for all the good government thereof.

In the compting-house is the board of green-cloth.

COMPTON, Henry, in Biography, an eminent English bishop, was the youngest son of Spencer, the second earl of Northampton. He was born in the year 1632, and, though deprived of his father by death at a very early age, was initiated with great care in the rudiments of learning, after which he was entered at Queen's college, Oxford, where he prosecuted his studies with much diligence, till the year 1632. From the university he went to the continent, with a view of perfecting himself in the modern languages, and of acquiring an accurate knowledge of foreign establishments, ecclesiastical and civil. On his return, he accepted under Charles II. a canon's commission in the king's horse guards, which he soon resigned and devoted himself to the service of the church. He was immediately admitted to the degree of master of arts in the university of Cambridge, and afterwards obtained the grant of the next vacant canonry of Christchurch, Oxford. In 1666, he was admitted canon-commoner of that college, and shortly after was in possession of the rectory of Cottenham in Cambridgeshire. He was in the following year made master of St. Crofie's hospital near Wisbech, and in 1669 installed canon of Christ church. Without further delay he took the degrees first of bachelor of divinity, and then of doctor of divinity. In 1674 he was nominated to the bishopric of Oxford, where he remained but a single year, when he was appointed dean of the royal chapel, and translated to the see of London. For these valuable and highly important preferments, Dr. Compton was indebted as well to his own excellent character as to his family connections. Soon after he had been made bishop of London, he was sworn in of his majesty's privy council, and undertook the supervision of the religious education of the princesse Mary and Anne. To the conscientious discharge of his duty as a preceptor may be justly ascribed the zealous attachment of his pupils, afterwards sovereigns of England, to the Protestant religion, as by law established. This worthy prelate endeavored to devise methods of reckoning the differences to his own church; his intentions were unquestionably good, but some of the means which he used to effect his purpose could not be justified on the principles of protestantism. Under the pretense of guarding the church from heresy, he obtained a royal mandate to prohibit certain discussions on the doctrine of the Trinity; he nevertheless showed himself a decided friend to the Protestant reformation, and encouraged his clergy to defend it with Christian zeal, when the principles of popery, or a more blameable indifference to all religion, were encouraged by the profligate court of Charles II. His conduct in this respect, which cannot be too highly applauded, rendered him obnoxious to the king and to his brother, who soon after ascended the throne as James II. The name of the excellent prelate was immediately after this event struck out of the list of the privy council, after which he was deprived of his office as dean of the royal chapel. For refusing to become an instrument of ecclesiastical tyranny among his own clergy, and to sanction various unconstitutional measures of the king, he was, in 1686, suspended from his episcopal office. In 1688 the dread of a revolution in favour of the prince of Orange, induced the king to attempt regaining the affection of Dr. Compton, and that of the other clergy, who had been lately treated, by restoring them to their office. It was, however, too late to effect a reconciliation, and the bishop shortly after took a decided part in favour of the new order of things. He joined in conducting the princess Anne of Denmark from London to Nottingham; in after time he was made a Lord. He died, and in waiting on the prince of Orange at the head of his clergy, to thank him for his interference in preserving the laws and liberties of the nation; and in the house of peers he voted for the prince and princess of Orange in the room of the abdicated king. Immediately after this event he was determined on, he was restored to the office of privy counsellor, and to that of dean of the royal chapel; he had also the honour of performing the ceremony at the coronation of King William and Queen Mary, instead of archbishop Sancroft, who refused to take the oaths to the new government. In the year 1689 he was appointed one of the commissioners for reviewing the liturgy, and president of the convocation, in which certain proposed amendments were to be discussed. In this situation he at first joined the moderate party, who were for compromising differences by adjusting the liturgy to their minds, but afterwards he united himself with those members who avowed and obtained the discontinuance of the convocation faction. Dr. Compton was appointed, as bishop of London, a commissioner of trade and plantations, and in this capacity he declined and sent over
over to the colonies in America, such clergymen as he thought best adapted, by their talents and zeal, to promote the interests of the Church of England. In the year 1765, he attended the king, at his own expense, to the congress at the Hague, where the grand alliance against France was concluded. From this period he united himself more closely with the Tory party, in consequence of which his influence at the court of king William was greatly diminished, if not wholly terminated; but in the reign of queen Anne, he recovered his former power and interest. Dr. Compton was in the commission for promoting the union of Scotland with England; he was assiduous in obtaining the act for augmenting small livings, by a grant of the first fruits and tithes; and he maintained a friendly correspondence with the foreign Protestant churches, and the university of Geneva, with a view of impressing them with favourable sentiments towards the Church of England, and of obtaining their disapprobation of those who should dissent from its discipline. He died at Fulham in the year 1713, in the eighty-first year of his age. For some time before his decease he is represented to have been much in the power of others, and to have followed their will rather than the dictates of his own mind. Through the whole of a long life he was exemplary in his moral conduct, and displayed the manners of a gentleman. He was a warm friend, a generous patron, and truly charitable to the wants of those about him. As a bishop he maintained the interests of the church, and was attentive to the conduct and advancement of his clergy, but as a preacher he was extremely dull and inanimate. His character as a literary man was respectable, though his works are not numerous nor of the first rank in merit. He published a translation from the Italian of "The Life of Donna Olympia Maldachini, who governed the church during the time of Innocent X." "The Jesuits' Intrigues with private Instruction of that Society to their Emulations," translated from the French. "A Treatise of the Holy Communion," and letters to the clergy at different periods, which were reprinted in 1766, under the title of "Episcoplia, or Letters of the Right Reverend Father in God, Henry Lord Bishop of London, to the Clergy, &c." He also published "A Letter on Non-reliance," which may be seen in memoirs of Mr. John Kettlewell. Dug. Brit. Todd's Continuation of Rapin, vol. vi. &c.

COMPTON, Little, in Geography, a town of the United States of America, in Rhode island.

COMPTONIA, in Botany, (so named by Dr. Salander, in honour of the right reverend Henry Compton, lord bishop of London, who cultivated many exotics at Fulham.) L'Herit. Strup. Nov. Schreb. 1764. Wild. 1644. Gart. tab. 50. 57. 6. (Liquidambar aphnifoillum; Lian. Sp. Pl. Myrica, Linn. Hort. Cliff. Gale marina. Petr. Mus. 753. Myrti brabantissimi americanis; Philk. ann. 250. tab. 100. fig. 6, 7.) Species near three feet high, shrubby, slender, hairy, branched. Leaves from three to four inches long, half an inch broad, alternately situated, almost to the midrib, resembling those of spleenwort, dark green, hairy underneath, sitting close to the flanks. Male catkins lateral, erect. Nut offensive, turgidly lenticular, naked, smooth, shining. Obsoletely broad, of a bay colour. A native of New York, Pennsylvania, Virginia, and Carolina; cultivated by the botanists of London in 1714; flowering from March to May. Balf. was well acquainted with it in Carolina, and observed, that the branches generally died at the end of the third year, the new wood then succeeding to the old, as in the rubis; it was also seldom found in fruit, though it flowered abundantly.

COMPTROL, or Controle, is properly, a double vellaller, kept of the officers of the officers or commissioners in the revenue, army, &c. in order to receive the true state thereof, and to certify the truth, and the due keeping of the acts subject to that enregistrement. See RECENT.

COMPTROLLER, an officer established to comptrol, or over-see public accounts, and to certify, on occasion, whether things have been comptrolled and examined, or not. Thus, we have a comptroller of the king's boydall, or of the accounts of the board of green-clath; comptroller-general of the customs; comptroller of the navy; comptroller of the mint; comptroller of the exchequer; comptrollers of the accounts of the army; of the chamber, &c. See CLERK.

COMPTROLLER of the Artillery, is the person who inspects the artillery-mutters, makes out the pay lists, takes the accounts of stores and the remainder of them, and is accountable to the office of ordnance.

COMPTROLLER is also the name of an officer, who superintends, examines, and inspects the accounts of the army at large.

COMPTROLLER of the hanaper, is an officer in chancery, attending the lord chancellor daily in term and fealt time. This officer is to take all things sealed from the clerk of the hanaper, inclosed in bags of leather, and to note the just number and effect thereof; to enter them in a book, with all the duties belonging to the king and other officers for the same, and to charge the clerk of the hanaper with them. See CLERK AND HANAPER.

COMPTROLLERS OF THE PELLS are officers of the exchequers, whereof there are two, viz. two chamberlains clerks, who keep a comptrol of the roll of receipts, and going out; originally they took notes of other officers' accounts, in order to discover if they did amiss.

COMPTROLLER of the pipe, an officer of the exchequer, who writes out summonses twice a year, to levy the farms and debts of the pipe. See EXCHEQUER AND PIPE.

He was anciently called duplex ingressor.

COMPTROLLER'S BAY, in Geography, a bay of the Pacific ocean in the N.W. part of America, situated to the north of Cape Sucking, and of an island, stretching S. E. and N.W. about 3 leagues, and lying on the N.W. side of the N. E. end of Kaye's island. N. lat. 60° 6'. W. long. about 21° 30'.

COMPULSION, and inevitable Necessity, in Law, constitute a species of defect of will, and they denote such constraint upon the will, by such a man is urged to do that which his judgment disapproves; and which, it is to be presumed, his will (if left to itself) would reject. As punishments
punishments are only intended for the abuse of that free will, which God has given to man, it is highly just and equitable that a man should be rewarded for those acts, which are done through unavoidable force and compulsion. Of this nature is the obligation of civil subjection, whereby the inferior is constrained by the superior to act in a manner contrary to what his own reason and inclination would suggest; as when a legislator establishes iniquity by a law, and commands the subject to do an act contrary to religion or found morality. How far the excuse will be admitted in foro conscientiae, or whether the inferior in this case is not bound to obey the divine rather than the human law is a question, which admits of no doubt. Nevertheless, obedience to existing laws is unquestionably a sufficient extenuation of civil guilt before the municipal tribunal. The sheriff, who burnt Latimer and Ridley, in the bigotted days of queen Mary, was not liable to punishment from Elizabeth, for executing an order for the destruction of two of her subjects. But in civil cases, the principal cause whereof the inferior is answerable as a delinquent, is the exigency of the municipal community: the inferior, for example, may be liable for injuries to his property, which are done by a superior, even when the superior does it by the superior's authority, or under the compulsion of the public interest or command of the sovereign. And, therefore, if a woman commit adultery, or other civil offences against the laws of society, by the command of her husband; or even in his company, which the law construes a cohabitation; she is not guilty of any crime; being considered as acting by compulsion, and not of her own will. (1 Hal. P. C. 45.) This doctrine is at least a thousand years old in this kingdom, being found among the laws of king Ina the West-Saxon.(cap. 57.) This rule, however, with regard to crimes, admits of an exception in crimes that are mortal in law, and prohibited by the laws of nature, as murder and the like. Also in treason, no plea of coverture shall excuse the wife. In inferior misdemeanors there is likewise an exception; for a wife may be indicted and hath in the pillory with her husband, for keeping a brothel. And in all cases where the wife is offends alone, without the company or coautory of her husband, she is responsible for her offence, as much as any malefe. Another species of compulsion or necessity is what our law calls adffictio per mationem; which is, a third force of necessity, distinguished from the actual compulsion of external force or fear, is, when a man has his choice of two evils, yet the worse, and being under a necessity of choosing one, he chute the lesse punished of the two. Of this sort is that necessity, whereby a man by the commandment of the law is bound to enrich another for any capital offence, or to dismiss a riot, and resistance is made to his authority; it is in this case justifiable and even necessary to bat, to wound, or perhaps to kill the offender, rather than permit the murderer to escape, or the riot to continue. (1 Hal. P. C. 53.) There is another case of necessity, which has occasioned much speculation among the writers upon general law; viz. whether a man in extreme want of food or clothing may justify himself, to relieve his present necessities. Grotius and Puffendorf, and many other of the foreign jurists, maintain the affirmative; alleging that it is just cases the community of goods by a kind of tacit concession of society is revived. Some of our own lawyers have held the same opinion (See Buxton, c. 10. Mitr. c. 4. § 16). Though it seems to be an unwarranted doctrine, borrowed from the notions of some civilists; as at least, it is now antiquated; the law of England admitting no such except at present. (1 Hal. P. C. 54.) However, the founders of our constitution have thought it better to vest in the crown the power of performing particular objects of compulsion than to constance and establish the example of a general acknowludging law. (Blackft. Com. vol. iv.)

COMPULSOR, formed of the verb compellere, to oblige, percurrin, an officer under the Roman emperor, dispatched from court into the provinces, to compel the payment of taxes, &c. not paid within the time preferred.

Thus were charged with so many exactions, under colour of their office, that Honorius called them by a law in 412.

The laws of the Visigoths mention military compellors; who were officers among the Goths, whose business was to oblige the tardy folders to go into the fight, or to run an attack, &c.

Caflian mentions a kind of monastic compellors, whose business was to declare the hours of canonical office, and to take care the monks went to church at the fixed hours.

COMPULTERIA, in Ancient Geography, a town of Italy, in Campania. It is described to former times to have been the residence of the Roman emperors. Thus is it founded by Honorius but Fabius restored it by the sword.

COMPUNCTION, formed from commiseration, of puerors, to pray, in Theology, an inward grief in the mind for having offended God.

The Romans own their confession insignificant, unless attended with compunction, or pricking of heart. See Confession.

Among spirituists, compunction bears a more extensive significance; and implies not only a grief for having offended God, but also a pious feeling of grief, sorrow, and diftisfaction, on other motives. Thus, the miseries of life, the danger of being lost in the world, the blindness of the wicked, &c. are to pious people motives of compunction.

COMPARATOR, in Law, one that by oath justify, or declare, another's innocence. They were introduced as evidence in the jurisprudence of the middle ages, and their number varied according to the importance of the subject in dispute, or the nature of the crime with which a person was charged. In some cases these comparators were multiplied to the number of three hundred. (Barnes, Nicol. ed Vitkins, p. 11.) But the usual number was eleven. It has, indeed, been held by later authorities, that fewer than eleven comparators will answer the purpose; but Sir Edward Coke is positive that there must be this number; and his opinion is founded both on better authority and on better reason, for as wager of law is equivalent to a verdict in the defendant's favour, it ought to be established by the same or equal testimony, namely, by the oath of twelve men. Thus Glanvill expresses it (ib. c. 9.) "labora duodecima manu"; and in 9 Hen. III. when a defendant in an action of debt waged his law, it was adjudged by the court "quod defendentis duodecima manu." Thus too, in an author of the age of Edward I., we read, "aujudicatitur reus et legitum etem duodecima manu." And the ancient treatise, entitled, "Diversio de causa," expressly confines Sir Edward Coke's opinion.

This device, which was adopted for rendering the pur-
ties of blood connected him. Whoever then was bold enough to violate the laws, was safe of devoted adherents, willing to act and eager to screen him in whatever manner he required. The formality of calling compurgators proved an apparent, not a real security, against falsehood and perjury; and the sentences of courts, while they continued to refer every point in question to the oath of the defendant, became so flagrantly iniquitous as to excite universal indignation against this method of prevention. See Oath and Wager of Law.

COMPUTATION, the manner of accounting and estimating time, weights, measures, and money. The word is sometimes also used among mathematicians in the like sense as Calculation.

COMPUTATION of a planet's motion. See Planet.

COMPUTATION is particularly used in Law in respect of the true account, or computation of time, so understood, as that neither party do wrong to the other, nor the determination of time be left at large, or be taken otherwise than according to the judgment and intention of law.

A deed, dated May 11, to hold from the day of delivery, shall be construed to begin on the 15th day of May.

If indentures of demife be ingrossed, bearing date May 11, 1760, to have and to hold the land in S. for three years from henceforth; and the indentures be delivered the 4th of June following; in this case, from henceforth shall be computed from the day of the delivery, and not from the date. And if the indentures be delivered at four of the clock in the afternoon, the said 4th of June, the lease shall stand the third day of June in the third year; the law, in such computation, rejecting all fractions or divisions of the day, on account of that uncertainty which is the mother of contention. In writings, ordered by the flat. 27 Hen. VIII. to be inrolled within fix months, if such writings have date, the fix months shall be accounted from the date, and not from the delivery: if they want date, it shall be accounted from the delivery. Coke, lib. 5.

If a deed be shewn to a court at Windinfield, it shall remain in court (by judgment of law) all the term in which it is shewn: for all the term is but as one day in law. Coke, ibid.—If a church be void, and the patron does not present within fix months, the bishop of the diocese may collate his chaplain; but these fix months shall be computed according to 28 days of the month; and not according to the calendar.

COMPUTATION of Miles, after the English manner, allows 5280 feet, or 1760 yards to each mile; and the same shall be reckoned, not by straight lines, as a bird or arrow may fly, but according to the nicest and most usual way. Cro. Eliz. 212.

COMPUTO, a writ thus called from its effect, which is to compel a bailiff, chamberlain, or receiver, to yield his accounts. It is founded on the statute of W. & M. 2. c. 12.

COMPTA, in Ancient Geography, a town of Italy, in the territory of the Hirpini, towards the frontiers of Lucania. Hannibal, after the battle of Cannae, was invited into the country of the Hirpini by Statius, who promised to surrender to him the town of Compta. The modern name is CONS or CONZA. See also COMPZA.

COMRADE is a common appellation for a fellow-soldier in the same regiment, troop, or company.

COMSHE, in Geography. See COMSHE.

CONAT .VENDAINT, a country situated in the south of France, formerly belonging to the pope, by whom it was ceded, together with its chief city Avignon, to the French government, soon after the revolution of 1789. It now forms part of the department of Vaucluse.

COMTE, Count. The titles of comte, of duke, of vicar, of centurion, or burgun before the time of Charles the Bald, were not hereditary in families. These offices alleviated the finances and justice in the provinces: they were, at the same time, magistrates and military characters; they convoked the bail and arriere-bail. They assembled and conducted the troops to the general rendezvous. And when they judged a cause they had their shield on.

CONTE du Palais. See MAJORROME.

COMUM, in Ancient Geography, a town of Gallia Transpadana, situated towards the north, on the southern bank of the lake Larius. It was founded by the Gauls, became a Roman colony, and was enlarged by Scipio. Julius Cesar established Greeks in it, and then called it the new Comum, but upon their departure it lost this epitaph. It was a municipal town. Pliny founded in it schools and a public library. See COMUM.

COMUS, in Mythology, the god of jollity or festivity. There is great reason to believe, he was the Chamos of the Moabites; Bala-Phorig, Bala-Poor, Priapus, and Bacchus. He is represented under the appearance of a young man, with an inflated red countenance, his head inclined, and crowned with flowers; his air drowsy; leaning on a huntsman's spear in his left hand, and holding an inverted torch in his right. His statue was placed at the chamber doors of new married persons; his pedestal crowned with flowers.

CON, Ital. a proposition, placed before many musical terms; as Con arie, with the bow, after a piu riconato, which fee. Con fordini, with the fordini or mute. Con affetto, tenderly. Con furore, furiously. Con effenzione, differently, as to rapidity. Con violini, with violins, &c.

CONADIPSAS, in Ancient Geography, an ancient town of Scythia, on the other side of Imaus.

CONAFADOS, an episcopal town of Arabia, under the metropolis of Boitra.

CONAJOHARY, in Geography, a pilt town of America, on the south side of Mohawk river, in the state of New York, 36 miles above Schenectady, and 313 from Philadelphia.

CONAME, in Botany, the name given by Aublet to a genus formed by him for a shrub found in Cyenche, which has since been considered as a phyllanthus. He gives it the following character. Male and female flowers on different plants. Calyx fix-cleft. Cor. none. Stam. numerous. Pfl. Germ diatated; style bifid; stigma villous. Peric. Caps. fix-celled.

CONANA, in Ancient Geography, an episcopal town of Asia, in Pamphylia.

CONANICUT, in Geography, an island near the coast of America, a little to the east of Rhode Island. N. lat. 41° 25'. W. long. 71° 20'.

CONANT, John, in Biography, was born at Yeatenton, Devon, in the year 1608. He was entered at Exeter college, Oxford, in 1626, where he acquired great reputation for his diligence and for his talents as an able disputant. As a classical scholar he was remarkable for the purity of his Latin style, and for his intimate and extensive acquaintance with the Greek language. He was also well versed in the several oriental tongues. In 1652, he was chosen fellow of Exeter college, where his fame, as a tutor, procured him pupils from many very respectable families. He m.
commencement of the civil wars obliged him to retire from
the university, and he officiated for some time at the living
of Lymington, where he was plundered of his property,
and imprisoned. As soon as he was liberated he went to
London, and became domestic chaplain to Lord Chasno.
While he continued in his lordship's house at Hanfield in
Middlesex, he preached a gratuitous lecture at Uxbridge
on a week day to numerous audiences. On the 7th of June
1694, he was unanimously chosen rector of Exeter college,
without any solicitation on his own part. Shortly after
this he was in danger of being driven out of all public em-
ployment, by the parliament's requiring his subscription to
the "engagement," by which a promise was to be given to
be true and faithful to the commonwealth of England,
without a houfe of lords. This he at first declined; having
however a fortnight given him to reconsider the matter, he
submitted; but under a declaration, subfribed at the same
time with the "engagement," which rendered that instrument
almost nugatory. He now entered upon his office as rector
with increased zeal, and discharged the several duties incum-
benent upon him, with the utmost diligence and fidelity.
In December 1674, he was appointed divinity-professor of
the university of Oxford, and in three years afterwards he
was raised to the dignity of vice-chancellor of that univer-
sity, which he retained till August 5, 1675. While he held
this high office, he was very instrumental in procuring Mr.
Selden's valuable collection of books for the public library;
he distinguished himself by the correction of abusés, and by
the regulation of the public exercises in such a manner, as
proved highly beneficial to the interests of solid learning.
By some of his biographers, Mr. Conant has been applauded
for the share which he took in defeating a project for erect-
ing an university in the county of Durham. Praise on this
account to us seems very ill bestowed, because the intended
object was worthy of a great nation, whose places of public
instruction cannot be regarded as sufficiently numerous, to
supercede the necessity of others in distant parts of the
kingdom. Upon the restoration of Charles II. Dr. Co-
rant, in his official capacity, came to London, attended by
the proctors, and others, and being introduced to the king
he made a Latin speech on the occasion, and prefented his
majesty with a book of verses written by the members of
the university. He was appointed, in March 1661, a commis-
fioner with others to review the book of common prayer,
and he siflled at the Savoy conference. After this, upon
the passing of the act of uniformity, he was debarred of his
preferments, because he refused to conform. During eight
years he lived in retirement, when, upon fervent deliberation
on the nature and lawfulnefs of conformity, he resolved
to comply, and submitted to a re-ordination by Reynolds, bi-
shop of Norwich, whose daughter he had married nearly
twenty years before. Preferments were now immediately
offered to his choice; and he accepted of the vicarage of
All-Saints, Northampton, in which town he had for sever-
al years resided, in the highest estimation of the most re-
spectable inhabitants. In Sept. 1673, his church and the
greater part of the parish were destroyed by fire; but his
own house escaped. In the succeeding year the bishop of
Norwich offered him the archdeaconry, with this high com-
pliment, "I do not expect thanks from you, but shall be
very thankful to you, if you will accept of it." He con-
ced to this handiome requirt, and discharged the office
worthily, as long as his health would allow. In December
1681, he was initiated a prebendary in the church of Wor-
caster, at the request of the earl of Radnor, who asked for
it of the king, saying he came to beg preferment for a very
delivering person, who never sought any thing for himself.
He had long laboured under a weakness of body, which
terminated in total blindness in the year 1686. This heavy
calamity, and the weight and infirmities of old age, he
bore with exemplary resignation to the divine will till his
death, which happened March 12, 1693. He was interred
in his own parish church of All-Saints in Northampton,
where a handsome monument was erected to his memory.
Dr. Conant was a man of solid and extensive learning, but
his great diffidence led him to conceal his acquirements. We
have five volumes of his sermons, of which one was dedicated
by himself to the inhabitants of Northampton, the others
were published after his death, by Dr. John Williams,
 Afterwards bishop of Chichester, and Mr. Coates principal

CONARIUM, in Anatomy, a term which has been ap-
p lied to the small gland of the brain, in consequence of its
conical figure. See Brain.

CONATUS, endeavour, a term frequently used by phi-
losophers and mathematical writers; nearly equivalent to
nuit. Conatus seems to be the same, with respect to motion,
that a point is with respect to a line; at half the two
have this in common, that as the point is the extreme of
the line, or the term from which it commences; so is the begin-
ning of all motion called the conatus. And, that as in
mathematical demonstrations, the extension of the point is con-
ceived as if it were nothing at all; so, in the conatus of
motion, there is no regard to the time wherein, or the length
which, it advances. See Laws of Nature.

Hence, some define conatus to be a quantity of motion
not capable of being expressed by any time or length.
Accordingly, all motion tends precisely the same way wherein
the moveable is acted on, or determined by the same moving
power. See Motion.

CONAWANGO, in Geography, a northern branch of
Allegany river, in Pennsylvania, which rises from Cha-
nguee lake.

CONCA, CAY. SEBASTIANO, in Biography, an historical
painter of considerable reputation in the 18th century. He
was born at Gaeta in the year 1676, and became the disciple
of F. Solemene, the most celebrated master of the school of
Naples at that period. At the age of forty, Conca estab-
lished himself at Rome, and spent five whole years in
drawing from the faithful productions of ancient and modern
art, in the vain hope of uniting to the graceful facility he
had acquired from his master, a greater purity and correct-
ness of design. But it was too late; bred a manufact, he
had infensibly imbibed those maxims which were to decide
his future character; and at length he had the good felic
ity to adopt the advice of the sculptor Le Gros, by purity-
ing the track which had originally been pointed out to him.
He soon became an able machinist (pietre di macchina), in
a style not very unlike that of Cortona. He united to facili-
ty of invention, and rapidity of pencil, a gay and fa-
cinating distribution of colour; but his flesh has generally too
green a hue in the shadows. Amongst his large works at
Rome, the "Assumption," at the church of St. Martino, and
the "Prophet Jonas," at St. Giovanni Laterano, are of
the best. Many of his other productions are at Loretto,
Ancona, and other towns of the ecclesiastical state, besides
an infinity of cabinet pictures dispersed throughout all parts
of Europe. This artist died in 1764. He had a brother,
Giovanni Conca, who assisted him in the execution of many
of his large works, and is said to have been an excellent
copyist. Lanzi, Storia Pictorica.

CONCA, in Geography, a town of the island of Corfus;
12 miles N. of Porto Vecchio.—A T, a market town in a
small lake in the Campagna di Roma, in Italy.—All, a
small
small river of Italy, which has its source in the duchy of Urbino, and flows into the gulf of Venice.

Concam. See Concave.

Concave Bay, in the channel, on the coast of the department of Hilly and Vilaine in France, is a fine bay, in which the English effected a landing in June 1758, and whence they proceeded to the port of St. Malo, where they burned about 100 vessels of different kinds.

Concamerated, among Builders, an appellation given to such roofs as are arched in the vaults.

Concameration, was an arched room in our ancient churches, between the east end of the church and the high altar; so formed, that in processions they might surround it.

Concan, or Cockun, in Geography, a tract of country on the western coast of Hindoostan, situated between Bombay and Goa, and separated from the rest of the continent by a ridge of high mountains called the Gauis. When the Moguls seized on Hindoostan, they found this coast infested with pirates, and fitted out a fleet to protect their vessels. The Maharratns, finding their pirates interrupted, armed against the Moguls, ravaged their possessions, and fitted out a fleet to protect their pirates. Conagy Angria, who by his courage had acquired the supreme command, was appointed governor of Severndroog, one of the fortresses on the coast, where he formed an independent state, and in a little time extended his dominions for the space of 40 leagues along the coast, and six leagues wide towards the mountains. His successors assumed the name of Angria, and made peace with the Maharratns on paying an annual tribute. They continued to make depredations on the coast, and seize all vessels that passed that way till the year 1776, when their fleet was destroyed, and the strong fort of Ghairah, in which the chief refiined, was taken by admiral Wotton and colonel Chive. The country now belongs to the Maharratns. The principal towns are Choul, Fort Victoria, Dehri, Severndroog, Ghairah, Tamans, and Sunderdoo.

Concana, in Anciant Geography, a town of Spain, towards the north-east of Lucus Aferum, and to the south of Salis, near the sea. Horace says, that the inhabitants of this city took pleasure in drinking the blood of horses: and although a change took place in the manners of the people in Spain under the dominion of the Romans, Silius Italicus, who wrote under Trajan, gives an account of them similar to that of Horace.

Concangium, a Roman station, under the government of the honourable the duke of Britain, not mentioned in the itinerary, but recorded in the Notitia Imperii, and generally believed to have been situated at Watercrook, near Kendal, where are visible remains of a Roman station, and where Roman antiquities have been found.

Concarneau, or Conquerneau, in Geography, a small, but neat sea-port town of France, in the department of Finisterre, and chief place of a canton in the district of Quimper, 43 miles S.E. of Brest. The place contains 2,520, and the canton 6,320 inhabitants; the territory includes 12,7 kilometres, and 4 communes. Its principal and almost only trade, is in pickards, of which the average annual shipment is 600 barrels. The price of a barrel varies from 150 to 200 livres. N. lat. 47° 55'. E. long. 3° 45'.

Concatenation, in Philography, a connection of things, in manner of a chain.

The concatenation of second causes is an effect of Providence. See Cause.

Concave is applied to the inner surface of a hollow body; particularly if it be circular.

Concave is particularly understood of mirrors and lenses; concave lenses are either concave on both sides, called concavo-convex; or concave on one side, and plane on the other, called plano-convex; or concave on one side, and convex on the other, called concavo-convex, or concavo-concave, as the one or the other surface is a portion of a left sphere.

The property of all concave lenses is, that the rays of light, in passing through them, are deflected, or made to recede from one another; as in convex lenses they are refracted towards each other; and that the more, as the concavity and convexity pertain to lens circles.

Hence, parallel rays, as those from the sun, by passing through a concave lens, become diverging; diverging rays are made to converge the more, and converging rays are either made to converge less, or become parallel, or go out diverging.

Hence, objects viewed through concave lenses appear diminished; and the more so, as they are portions of left spheres; and this in oblique, as well as in direct rays. See Lens.

Concave mirrors have the contrary effect to lenses: they reflect the rays which fall upon them, so as to make them approach more to, or recede from, each other than before, according to the situation of the object; and that the more as the concavity is greater, or the spheres whereof they are segments, less.

Hence, concave mirrors magnify objects presented to them; and that in a greater proportion, as they are portions of greater spheres. See Mirrors.

Hence, also, concave mirrors have the effect of burning objects, when placed in their focus. See Burning-Glass.

Concavity. An arch of a curve has its concavity turned one way, when the right lines that join any two of its points are all on the same side of the arch.

Archimedes, intending to include such lines as have rectilinear parts, in his definition, says, a line has its concavity turned one way, when the right lines that join any two of its points are either all upon one side of it, or while some fall upon the line itself, none fall upon the opposite side. Archim. de Sphær. and Cyl. Def. 2. Mac Laurin's Fluxions, art. 180.

When two lines, having their concavity turned the same way, have the same terms, and the one includes the other, or has its concavity towards it, the perimeter of that which includes, is greater than the perimeter of that which is included. Archim. ib. ax. 2.

Concealers, in Law, such as find out concealed lands, i.e. lands kept privy from the king, by common persons, having nothing to shew for their title, or edate therein.

They are thus called per apathes, a concealas; as monas is a movenda, &c. Lord Coke calls them turbidum bonum genus.

Concealment of Laughter's death. See Bastard.

Concealment of Treason. See Misprision.

Concelho de Angliaens, in Geography, a town of Portugal, in the province of Traes-Montes; 8 miles W.N.W. of Miranda.

Concelho de Jate, a town of Portugal, in the province of Traes-Montes, 10 miles W.S.W. of Miranda.

Concellana, a town of Naples, in the province of Bafiluzza; 5 miles S. of Accenza.

Concentage, a town of Spain, in the province of Valencia; 25 miles N. of Alicante.
CONCENTRATION, in general, denotes the retiring, or withdrawing of a thing inwards, towards the centre, or middle.

External cold is said to concentrate the heat within bodies: after meals, the natural warmth retires, and as it were concentrates to promote the digestion. This is also said by Dr. Grew for the highest degree of mixture, viz. that wherein two or more atoms or particles touch, by a reception, and intrusion of the one within the other. See MIXT.ION.

This he takes to be the case of all fixed bodies without taste or smell; their constitution being so firm, that till the particles be detached from each other by some extraordinary means, they cannot affect thosefenet.

CONCENTRATION, in Chemistry, the act of increasing the strength of fluids, which are rendered stronger by abstracting a portion of the mere menstruum. This is generally effected by evaporation, where the menstruum is driven off at a lower heat than is required to drive off the substance with which it is united. Thus, dilute sulphuric acid may be considered as a mixture of the real acid with water, and by applying a certain heat, the water may be evaporized, leaving the acid behind in a state of concentration. When concentrated as much as possible, its specific gravity is about twice as great as that of water, but it can rarely be obtained denser than 1.85. When concentrated to 2,000 it contains a considerable portion of water, as has been proved by combining it with barites or potash, in which case water remains behind, and does not enter into the combination. Again, vinegar consists of an acid and water, and brandy of alcohol and water, and in proportion as the acid and alcohol are freed from the water, they are said to be more or less concentrated. This may be performed, 1. Either by simple distillation, in which case the acid or spirit comes over first, leaving the water behind; or 2. By exposure the vinegar or brandy to severe frost, when the water will be frozen, and the acid or alcohol will be found in a state of concentration in the middle of the ice; the greater the cold, the higher the state of concentration; M. Lowitz has found, that the acid, however concentrated, congeals at -22°. Sulphuric acid, on the other hand, exposed to a much less severe cold, crystallizes, and to effect this, it must not be greatly concentrated. 3. Another mode of concentrating the acetic acid, is by distilling acetate of copper, reduced to powder, in a retort: at first there comes over a liquid nearly colourless, and almost inodorous, and afterwards a highly concentrated acid tinged with green; but being distilled a second time in a moderate heat, it is colourless, transparent, exceedingly pungent and concentrated. 4. The most perfect method of obtaining this acid in a concentrated state, was discovered by M. Lowitz of Petersburg; it is thus: distil a mixture of three parts of acetate of potash, and four parts of sulphuric acid, till the acetic acid has come over into the receiver. To separate it from the sulphuric acid, with which it is slightly contaminated, it must be distilled over a portion of acetate of barytes. By the experiments of Adet, Darraque, and others, on concentrating the acetic and acetic acids, it is ascertained that they differ only in concentration, each containing precisely the same proportion of oxygen. Concentrated acetic acid is capable of an accession of oxygen, and in that state it is called oxygenated acetic acid. Sulphuric and nitric acids, whether diluted or concentrated, are still the same sulphuric and nitric acids; but sulphuric, and phosphorus, or nitric and nitrous acids, whatever be the state of concentration, have different properties, and are of course specifically different acids. Elem. de Chymie. Thompson's Chemistry, Gren's Principles.

CONCENTRATION in Distillery. Dr. Shaw, in his "Essays on the Distillery," is for introducing a method of concentrating the fermentable parts of vegetables from which their spirits are to be drawn by distillation; which, if it can be brought to be practised in the large way, will prove of very great use to the British distillery, as it will greatly shorten the distiller's business, which, at present, including the brewing, fermenting, &c. is much too long. He proposes only to evaporate carefully the water, or other tinctures or decoctions of vegetables made for the distilling of their spirits, to the confidence of treacle: in this form they might be sold to the distiller, who might keep them by him as long as he pleased, and occasionally use them, by the easy method of reducing them into water, by mixing warm water with them.

CONCENTRIC, in Geometry and Astronomy, something that has the same common centre with another. The word is principally used in speaking of round bodies and figures, viz. circular, elliptical ones, &c. but may be likewise used for polygons, drawn parallel to each other, upon the same centre.

Concentric flats opposite to eccentric.

To find the area of the space included between the circumferences of two concentric circles; see AXIOMS.

Nonius's method of graduating instruments, confuted in describing with the same quadrant 45 concentric arches, dividing the outermost into 90 equal parts, the next into 89, &c. See NONIUS.

CONCENTRICITY of the Strata, in Natural History. The idea has very generally prevailed among geologists and mineralogical writers, that the several layers of matter or strata, which compose the surface of the earth we inhabit, were originally formed or deposited in uniform and level beds, or concentric to the centre or mass of the earth. Among these Mr. Whitehill, in his "Enquiry into the Original State and Formation of the Earth," 1st edit. p. 192, says, the strata "obtained an uniform concentric arrangement, surrounding the centre of the earth, as so many shells may be supposed to surround an egg." And nearly similar have been the opinions of a large portion of writers on this subject. Mr. Kirwan, "Geological Essays," p. 22, supposes, that the crystallization of strata from the chaotic or polynematic fluid, in some cases, began at the surface, as we see happen to some faults and to lime water under evaporation, and that thus extensive strata might have been formed and sunk to the bottom, moliy in an horizontal position, but often from accidental ruptures during their fall, in an oblique or nearly vertical position. Dr. Townson, "Philosophy of Mineralogy," p. 68, says, "we must not suppose that the strata regularly surrounded the globe like the concentric circles of an onion; they are rather like the scales of a billy; rather squamiform than tunicata. Though, in general, they are of great extent when not broken and joint, they are known to have a natural termination." In the "Philosophical Transactions," No. 391, Mr. John Stacey gives a figure for explaining a supposition of his on this subject, viz. that the strata were originally formed while in a soft state, as so many wedges, each pointing to and terminating in the axis of the earth; and that by the diurnal revolution of the earth from west to east, these became bent into spirals, each lapping round each other, for some distance, and then ending, in succession.

Whimsical as this last idea must have appeared, when it was first published, now more than 80 years ago, we are
CONCEPTION.

somewhat surprized that it had not the effect of occasioning subsequent geological observers to notice, more particularly, the endings of the Straits, and the remarkable prevalence of their dip towards the south-east, compared with those in any other direction; especially when practical miners must have to often mentioned the dip "towards the 10 o'clock line," as being the most common. Under the articles Coal, and Colliery, the writer of this has endeavored to show that the strata of the British islands end in succussion in proceeding from the south-western part of England towards the north-west; the general dip being towards the south-east or nearly so, except in immensely dilated parts of the country, as the wealds of Suffolk, Kent, and Surrey, the peak of Derbyshire and Staffordshire, &c. of which some further and curious particulars will be given under the articles Denudation, Elevation, and Endings of the strata.

From all which, it is expected that it will be made evidently to appear, that the strata were not originally concentric with the earth's centre, but that the same formed planes or zones, inclined eastward in a small angle with the horizon, which were of amazing extent, and were perfectly regular in their position, before they experienced the rude and almost inconceivable violence, which broke and tore the earth in pieces, and left it in its present form.

CONCEPTACULUM, in Botany, was originally applied by Linnaeus to that kind of feed-vehicle which he afterwards termed folliculus, and which consists of one valve only, burthing longitudinally, as in the natural order of afclepidae. Garttner uses the term conceptaculum in a general and lax sense for a feed-vehicle, nor is it at present technically applied to any particular kind of fruit.

CONCEPTION, in Geography, otherwise called Perez, a city of Chili, in South America, and capital of a juridiction or bishopric, suffragan of the archbishop of Lima, and having a chapter, consisting of a bishop, dean, archdeacon, and two prebendaries. The ancient city stood at the mouth of the river St. Pierre, E. of Talcahuana, on the S.W. shore of a beautiful bay, and on a small declivity, having a little river running through it, in S. lat. 36° 43' 15", and in longitude from the meridian of Teneriff, according to Father Feuillete, 30° 18' 30". The houses were built with mud or burnt bricks, and covered with tiles; the churches, and also the Franciscan, Augustine, and Dominican convents, as well as those belonging to the fathers of mercy, were small and mean, but the college of the Jesuits was constructed in a superior style of architecture. This city was first founded by captain Pedro de Valdivia in the year 1550; but the powerful revolt of the Indians of Arauco and Tucapel, obliged its inhabitants to remove to Santiago. Pedro de Valdivia, its founder, was killed in this contest, and his successor in the command shared the same fate. The inhabitants, however, petitioned the audience of Lima for leave to return to their original city; they were again either slain or dispersed by the Indians; but those that survived were afterwards restored to their former position, and they for some time continued to enjoy with apparent security. In 1693 a more general consideration was formed against the city, by which it was almost wholly destroyed; but receiving fresh succours, it was again repaired. Subject, however, to dreadful earthquakes, and confitting of buildings ill adapted for permanent duration; it was totally destroyed by an earthquake in 1751 and nothing but its ruins are now visible on the spot where it once stood. After the destruction of this town, which, during the earthquake, was swallowed up rather by the sea than by the land, the inhabitants dispersed and encamped in the environs. In 1763, they selected another spot, situated about a quarter of a league from the river Biobio, and three leagues from the ancient town of Conception, and the village of Talcahuana. On this spot they erected a new town, to which the bishopric, the cathedral, and the religious houses were transferred.

The houses consist only of one story, that they may be able more effectually to resist the shock of earthquakes, which occur in those parts almost every year. This town occupies a large extent of ground. The inhabitants are about 10,000; and here is the residence of the bishop and a colonel of horse, who is the military governor of the town. The bishopric is nominally bounded on the north by that of Santiago, the capital of Chili, where the governor-general resides, and on the east by the Cordilleras, and extending on the south as far as the straits of Magellan. But its true limit is the river Biobio, about a quarter of a league from the town. M. de la Perouse says of this part of Chili, that it is the most fertile spot in the world. Corn, he says, produces sixty-fold, and the vine is equally abundant; the fields are covered with innumerable flock, which, without requiring any care, multiply beyond all calculation. The only care necessary is to keep separate the different property of individuals; and oxen, horses, mules, and sheep herd together in the same pastures. A large ox is commonly worth eight dollars, a sheep ½ of a dollar; but there are no purchasers, so that the inhabitants kill every year a great quantity of cattle, the skins and tallow of which are sent to Lima. They also cure some provisions for the consumption of the small coasting vessels which navigate the south seas. The climate is remarkably healthy, and M. Peroue found several in this town that had completed 100 years; but notwithstanding all these advantages, the colony is not now thriving, which he attributes principally to the prohibitory regulations that extend through every part of Chili. This kingdom, he says, of which the productions, increased to their maximum, would supply all Europe; whose wool would be sufficient for the manufacture of France and England, and whose herds, converted into felt provision, would produce a vast revenue; has no commerce. Four or five small vessels bring every year from Lima tobacco, sugar, and some articles of European manufacture, which the miserable inhabitants receive after having been charged with heavy customs at Cadiz, at Lima, and, finally, at their arrival at Chili; in exchange for which they give their tallow, hides, some deals, and their wheat, which, however, bears so low a price, that the cultivator has no inducement to extend his tillage. Unfortunately, says Pérouse, for this country, it produces a small quantity of gold; the annual amount of which in the district of Conception is estimated at about 200,000 pistoles. The administration of justice is very defective. To these several circumstances it is owing that the land remains uncultivated, that commerce is in a low state, that the habitants are almost destitute of furniture, and that the only workmen in the town are foreigners. The dregs of the women confids of a plated petticoat, d'overing half the leg, formed of gold and silver fluff, which, being reserved for extraordinary occasions, is transferred, like jewels, from grand-mother to grand-daughter, striped stockings of red, blue, and white, and very short shoes, but such ornaments are only within the reach of a few; the rest having carelessly clothes to cover their nakedness. The idleness, together with the credulity and superstition of the inhabitants, has filled this kingdom with convents, both for men and women. The common people are a mongrel race, much addicted to theft, and the women are very coy of access. Nevertheless, those of a superior class, or the
true Spaniards, are extremely polite, and hospitable. The inhabitants, and even the women, excel in horsemanship; they are very dextrous in managing the lance and noose; and they rarely miss their aim, though at full speed, with the noose, which they throw 40 or 50 yards, and thus halter the object of their diversion or revenge. The noose is made of thongs of cow-hides, which they twine with oil, till it is rendered supple and, stiff. As to holding, it is fast, a wild bull which would break a halter of hemp of double thickness.


Conception, the bay of, is one of the most commodious that can be found in any part of the world. The length from Terra-firma, N. and S. is nearly 3½ leagues, and its breadth from E. to W. about 3 leagues, which is contracted by the island of Quiriquina, forming two entrances; of these, that on the east side is the safest, being two miles broad, and accordingly frequented by most ships. The west entrance is between the island and Talcaguna point, and is near half a league in breadth. In the principal entrance of this bay is 30 fathom water, which depth afterwards decreases to 11 and 12, till within about a mile of the shore, opposite to the entrance. The western entrance, though the numerous rocks and breakers in it make it appear very dangerous, has a channel with water sufficient for the largest ship, the depth being at first 30 fathoms, and never less than eleven. Within the bay are three roads or harbours, where ships anchor; for though the bottom be every where clear, it is only in one of these three places that ships can ride in safety, being no where else sheltered from the wind. The first, called Puerto Toro, lies close and well, with the north point of Quiriquina, contiguous to the coast of Terra-firma. The anchoring place is about half a league distant from the land; in about 12 fathom water. But this road is used only when the ships come in during the night; it being difficult to reach either of the other two before day-light, as several tacks must be made for that purpose. In this bay the principal port is that of Talcaguna. It is properly an elbow, and bears S.S.W. from the south point of Quiriquina. This is much the most frequented, ships in general anchoring here, as it has not only better ground than any other part of the bay, but is most sheltered from the north winds. Whereas at Curillo Verde, a little green mountain, situated near the city, they lie exposed not only to these winds, but also to the south winds; the land which should intercept them being low. Besides, the bottom is of a loose mud, so that the anchors in a hard gale of wind generally come home; and consequently the ships are in great danger of being stranded on the coast. From these inconveniences it may be concluded, that the only ships which anchor here are such as happen to be in these parts in the midst of summer, for which reason this road is most convenient, as it is nearest to the city. Although the tide rises in this bay five feet three inches, the water is smooth, and there is scarcely any current. It is high water here at the full and change of the moon, at 45 minutes past one. The bay is open only to the north winds, which never blow but in the winter, that is, from the end of May to October. Two rivers empty themselves into this bay; one of which passing through the city of Conception bears its name; the other is called St. Pedro. The first is the watering place for ships anchoring at Curillo Verde; whereas those at Talcaguna supply themselves from streams that flow from the adjacent eminences; they easily take on board a sufficient quantity of wood, of which there is plenty, and also of all other necessaries. Ships, before they enter the bay of Conception, endeavour to make the island of Santa Maria, and then coast along it keeping at the same time a good look out for a reef of rocks which stretches out almost three leagues from the north-west point; thence they continue their course, keeping at a little distance from the main, there being no rocks besides those that are above the water. After weathering the rocks on the island of Santa Maria, they fly directly for Talcaguna point, at the distance of about half a league; from which sea-ward is a rock called Quibra Olas, which should be carefully avoided, as it is surrounded with shoals. After being abreast of this rock, they steer for the north point of Quiriquina; off which two rocks swarming with sea-wolves; but as there is a sufficient depth of water all round them, there is no other danger in sailing near them besides that which is visible. After passing them, the course is continued as near as possible to the island of Quiriquina, care being taken to avoid some other rocks lying along the shore. In making several tacks to get into Conception-bay, the island of Quiriquina must be avoided on the east and south sides, as there is a shoal on the south extending to a considerable distance from the shore. At a third part of the distance between the road at Talcaguna, and the point of the same name, is another shoal, running about half a league towards the eait, in the middle of which is a ridge of rocks. To avoid this shoal, it is best at entering the bay with a land wind, to steer directly for the middle of a spot of red earth on a mountain of middling height, situated at the bottom of the bay, continuing this course till the ship has passed the shoal; and then to steer directly for the houses at Talcaguna, till within about half a mile from the shore, which is the usual anchoring place in 5 or 6 fathom water. The same care is also necessary to avoid another reef of rocks, lying between the Morro and the coast of Talcaguna.

Conception, or Conception de los Pampas, a town of South America, in Paraguay, on the S. side of the river Paraguay. S. lat. 30° 30'. W. long. 57° 11'.

Conception, La, a sea-port town of America, in the province of Veragua, on the Spanish main, with a harbour, formed by the river Veragua; 50 miles W. of Panama. N. lat. 3° 57'. W. long. 83° 51'.

Conception, a river of America, on the illusmus of Darien, which runs into the Spanish main. N. lat. 9° 4'. W. long. 78° 15'.

Conception Bay, a large bay on the east coast of Newfoundland island, whose entrance is between Cape St. Francois on the southward, and Flamborough head on the northward. It runs a great way into the land in a southerly direction, having numerous bays on the W. side, in which are two settlements, Carbonee and Havre de Grace. Settlements were made here in 1610, by about 40 planters, under Governor John Guy, to whom king James had granted a patent of incorporation. N. lat. 47° 40'. W. long. 52° 40'.

Conception de Salazar, or of Salayo, a small town of North America, in the province of Mexico, in Mexico. It was built by the Spaniards, as well as the nations of St. Michael and St. Philip, to secure the road from Mexico to the silver mines of Zacatea. N. lat. 10°. W. long. 83° 5'. They have also given this name to several bowards of America, to a sea-port of California, &c. &c.

Conception de la Vega, a town of Hayti, in what was formerly the Spanish part of Haiti, or St. Domingo. It gave the title of duke to the family of Columbus, the immortal discoverer of America.

Conception, in Grammar. See Syllepsis.
CONCEPTION.

Conception, in Logic and Metaphysics, the simple apprehension or perception which we have of any thing, without proceeding to affirm or deny any thing about it.

The schoolmen usually make two kinds of conception; the one formal, the other objective.

The first is defined to be the immediate and actual representation of any thing proposed to the mind: on which footing, it should be the same thing to the understanding, that a word or voice is to the ear; whence some also call it verba mentis.

The second is the thing itself represented by a formal conception. But others explode the notion of an objective conception, as being, in reality, no conception at all; excepting where the mind contemplates its own acts, &c.

Formal or proper conceptions, are subdivided into universal, where several things are indefinitely represented as under some common ratio, or in the same degree of perfection; analogous, where several things are represented as under some proportional likeness; and equivocal, where they are represented immediately as such, without regard to any common ratio or likeness.

Dr. Reid, in his "Inquiry into the Human Mind, on the Principles of Common Sense," and also in his "Essay on the Intellectual Powers of Man," (Eff. iv.), substitutes the word conception instead of the simple apprehension of the schools, and employs it in the same extensive signification. He also uses it, in common with some other writers, as synonymous with Imagination, which see. To this purpose, he says, that "conceiving, imagining, apprehending, understanding, and having a notion of a thing, are common words to express that operation of the understanding, which the logicians call "Simple Apprehension," which is defined by them to be the bare conception of a thing without any judgment or belief about it. However, although conception may be exercised without any degree of belief, even the smallest belief cannot take place without conception; for he who believes must have some conception of the object of his belief. Dr. Reid, without attempting a definition of this operation of the mind, explains some of its properties, states different theories concerning it, and points out some mistakes of philosophers in their account of it. In every operation of the mind, says this writer, and in every thing which we call thought, there must be conception. Our senses cannot give us the belief of any object, nor can we remember or reason, nor exert any of our active powers, without this mental operation; but in bare conception, there can, he thinks, be neither truth nor falsehood, because it neither affirms nor denies. In this respect, conception differs from opinion; as an opinion, though ever so wavering, or ever so modelly expressed, must be either true or false; whereas a bare conception, which expresses no opinion or judgment, can be neither; to this purpose, Mr. Locke observes very justly, if we sublimate conceptions for ideas, that our ideas, being nothing but bare appearances, or perceptions, in our minds, cannot properly and simply in themselves be said to be true or false, no more than a simple name of any thing can be said to be true or false. Mr. Locke, following the example of Des Cartes, Gassendi, and other Cartesian, has given the name of perception to the bare conception of things; and he has been followed in this respect by bishop Berkeley, Mr. Hume, and many late philosophers, when they are diffusing the subject of ideas. They have been probably led into this impropriety, says Dr. Reid, by the common doctrine concerning ideas, which teaches us, that conception, perception by the senses, and memory, are only different ways of perceiving ideas in our own minds; and if that doctrine be well founded, he thinks that it will be very difficult to find any specific distinction between conception and perception. He adds, there is reason to distrust any philosophical theory, when it leads men to corrupt language, and to confound, under one name, operations of the mind, which common sense and common language teach them to distinguish. This author further observes, when he is tracing the analogies that subsist between the operations of body and those of the mind in the plastic arts, and particularly in painting, that nothing more readily gives the conception of a thing than the seeing of an image of it; and hence, by a figure common in language, conception is called an image of the thing conceived. Nevertheless, the image in the mind is not the object of conception, nor is it any effect produced by conception as a cause, but it is conception itself. In this mode of illustrating conception, Dr. Reid differs from many other philosophers, who have generally maintained, that in conception there is a real image in the mind, which is its immediate object, and distinct from the act of conceiving it. This author proceeds to trace the analogy that subsists, not only between conceiving and painting in general, but between the different kinds of our conceptions, and the different marks of the painter. As this art illustrates fancy-pictures, or copies from the painting of others, or paints from the life, that is, from real objects of art or nature which he has seen, our conceptions, in Dr. Reid's opinion, admit of a very similar division. Some conceptions may be called fancy-pictures, being commonly called creatures of fancy or of imagination, which are not the copies of any original that exist, but are originals themselves. There are other conceptions, which may be called copies, because they have no original or archetype, to which they refer, and with which they are believed to agree; and we call them true or false conceptions, as they agree or disagree with the standard to which they are referred. These are of two kinds, viz. such as are analogous to pictures taken from the life, or such as we have of individual things that really exist; and such as are analogous to the copies which the painter makes from pictures done before, which are the conceptions we have of what the ancients called universals, or of things which belong or may belong to many individuals. These universals are always expressed by general words; and all the words of language, proper names excepted, are general words, or the signs of general conceptions, or of some circumstances relating to them. Such general conceptions are formed for the purpose of language and reasoning.

Having thus stated the three different kinds of our conceptions, and illustrated them at large, our author proceeds to describe their different properties. Accordingly he observes, that our conception of things may be strong and lively, or it may be faint and languid in all degrees. In this connection it is said, that imagination, when it is distinguished from conception, seems to signify one species of conception, viz., the conception of visible objects. Again, our conceptions of things may be clear, distinct, and ready; or they may be obscure, indistinct, and wavering. Moreover, when we barely conceive any object, the ingredients of that conception must either be things with which we were before acquainted by some other original power of the mind, or they must be parts or attributes of such things. Thus, a man cannot conceive colours, if he never saw, or felt them, if he never heard. If man has not a conception, he could not conceive what is meant by moral obligation, or by right and wrong in conduct. Nevertheless, we are uncon-
The powers of sensation, of *perception* of memory, and of conviction, are all employed solely about objects that do exist or have existed; but *conception* is often employed about objects that neither do, nor did, nor will exist. To prevent impudence in this matter, we ought to distinguish between that act or operation of the mind, which we call conceiving an object, and the object which we conceive. When we conceive any thing, there is a real act or operation of the mind; of this we are conscious, and can have no doubt of its existence; but every such act must have an object: for he that conceives must conceive something. For the different theories of conception stated by Dr. Reid, with his observations upon them, we must refer to the article *Idea.* This author eloses his account of the faculty of conception with an enumeration of what he conceives to be the errors into which writers have fallen in their discussion of the operations of the mind. In all judgment and in all reasoning, he says, conception is included. We cannot judge of a proposition, nor reason about it, unless we conceive or apprehend it; and therefore those are mistaken who do distinguish between conception, judgment, and reasoning, as to imply, that a conception, or even a syllogism, may not be simply apprehended. Dr. Reid further observes, that the division, commonly made by logicians, of simple apprehension into sensation, imagination, and pure intellect, seems to be, in several respects, very improper. Sensation, and the perception of external objects by the senses, are, in his opinion, very different operations of the mind; and, though commonly confounded by nature, they ought to be distinguished by philosophers. Neither sensation, nor the perception of external objects, is simple apprehension; because both, as he thinks, include judgment and belief, which are excluded from simple apprehension. Moreover, those who distinguish imagination from pure intellect, by referring to the imagination an image in the brain, and to pure intellect an image in the intellect, ground their distinction upon an hypothesis; since we have no evidence, as he apprehends, that there are images either in the brain, or in the intellect. See *Imagination.* Dr. Reid further observes, that it is a mistake to represent simple apprehension as the first operation of the mind; and, that, as a composition or combination of simple apprehensions, which mistake probably has arisen from supposing that sensation and the perception of objects by the senses, are nothing but simple apprehension. Although these are very probably the first operations of the mind, they are not simple apprehensions. See *Perception.* Instead of saying, that the more complex operations of the mind are formed by compounding simple apprehensions, we ought rather to say, that simple apprehensions are obtained by analyzing more complex operations. In this connection, Dr. Reid observes, that a similar mistake pervades the whole of Mr. Locke's *Essay.* It is this, that our simplest ideas or conceptions are got immediately by the senses, or by conception; and the complex afterwards formed by compound- ing them. He notices also another mistake concerning conception, which is, that our conception of things is a tell of their possibility; so that, what we can distinctly conceive, we may conclude to be possible; and of what is impossible, we can have no conception. This opinion has been held by philosophers for more than 100 years, without contradiction or dissent, as Dr. Reid believes; and he considers it as a necessary consequence of the received doctrine of idealism; since it is evident, that there can be no distinct image, either in the mind, or any where else, of that which is impossible. Our author has investigated this opinion, and urged a variety of objections against it. Whatever, he says, is declared to be possible or impossible is expressed by a proposition; and every proposition, of which you understand the meaning distinctly, is possible. Further, every proposition, that is necessarily true, stands opposed to a contradictory proposition that is impossible; and he that conceives one, conceives both; thus, a man who believes that two and three necessarily make five, must believe it to be impossible that two and three should not make five. Again, mathematicians, have, in many cases, proved some things to be possible, and others to be impossible; which, without demonstration, would not have been believed; "yet I have never found," says Dr. Reid, "that any mathematician has attempted to prove a thing to be possible, because it can be conceived, or impossible, because it cannot be conceived." Moreover, mathematicians often require us to conceive things that are impossible, in order to prove them to be false; and this is the case in all their demonstrations, "ad absurdum." For other particulars connected with the subject of this article, and a fuller view of Dr. Reid's illustration and reasoning, we must refer to his *Essay* above cited.

A late excellent writer, to whom those who wish to understand the philosophy of the human mind are under great obligation, though they may not admit all his principles and reasoning, has particularly considered the power of conception. By conception professor Dugald Stewart (see his "Elements of the Philosophy of the Human Mind," ch. iii,) means, that power of the mind which enables it to form a notion of an absent object of perception, or of a sensation which it has formerly felt. Although this is not exclusively the proper meaning of the word, yet he thinks that the faculty now defined deserves to be distinguished by an appropriated name. Conception is often confounded with other powers; memory recognizes the features of an absent or deceased friend, and every act of this faculty includes an idea of the past; whereas conception implies no idea of time whatever. Thus considered, the word conception corresponds to what was called by the schoolmen *simple apprehension;* with this difference only, that they included, under this name, our apprehension of general propositions; whereas the professor wishes to limit the application of the word *conception* to our sensations, and the objects of our perceptions. By thus restricting the application of the term, more than Dr. Reid has done, our ideas become more distinct; and for such a restriction the authority of philosophers in an analogous case may be justly pleaded. In ordinary language, we apply the same word *perception* to the knowledge which we have by our senses of external objects, and to our knowledge of speculative truth; and yet an author would be justly censoed, who should treat of these two operations of the mind under the same article of perception. "Thus," says the professor, "there is as wide difference between the conception of a truth, and the conception of an absent object of sense, as between the perception of a tree, and the perception of a mathematical theorem." For this reason, he has confined conception to that faculty, whose province it is to enable us to form a notion of our past sensations, or of the objects of sense which we have formerly perceived. The bullies of conception, thus defined, is to present us with an exact transcript of what we have felt or perceived. The first remarkable fact which strikes us with regard to conception is, that we can conceive the objects of our senses much more easily than those of others. Thus, we can conceive an absent visible object much more easily than a particular found, a particular taste, or a particular pain, which we have formerly felt. This peculiarity seems to arise from
this circumstance, that when we think of a found, or of a
name, the object of our conception is one single detached
notion, whereas every visible object is complex, and the
conception which we form of it as a whole, is aided by the
association of ideas, which connects the different parts to-
gether, and presents them to the mind in their proper arrange-
ment; whilst the various relations which these parts bear to
one another in point of situation equally contribute to
strengthen the associations. This power of conceiving visible
objects may be much improved by habit. These observa-
tions, together with others adduced by our author, are
applicable to conception as distinguished from imagination,
though the two powers are very nearly allied, and often so
blended, that it is difficult to say to which of the two some
particular operations or the mind are to be referred. Among
logicians, it is a common, and almost an universal doctrine,
that conception (or imagination, often used as synonymous
with it) is attended with no belief of the existence of its
object. To this purpose, Dr. Reid says, "perception is
attended with a belief of the present existence of its object;
memory with a belief of its past existence; but imagination
is attended with no belief at all; and was therefore called
by the schoolmen operpfius simpies." Professor Stewart
controversly the truth of this principle, and alleges several
circumstances in justification of his doubts concerning it.
If it were a specific distinction between perception and
imagination, that the former is always attended with belief,
and the latter with none; then, the more lively our imagination
were of any object, and the more completely that object
occupied the attention, the less should we be apt to be
lieve its existence; for it is reasonable to think, that when
any of our powers is employed separately from the rest, and
there is nothing to withdraw the attention from it, the laws
which regulate its operation will be most obvious to our
observation, and will be most completely discriminated from
those which are characteristic of the other powers of the
mind. So very different however is the fact, that it is
matter of common remark, that when the imagination is
very lively, we are apt to ascribe to its objects a real exis-
tence, as in the case of dreaming or madness; and we may
divide, in the case of those who, in spite of their own general
belief of the absurdity of the vulgar stories of apparitions,
dare not trust themselves alone with their own imaginations
in the dark. That imagination is in these instances attended
with belief, we have all the evidence that the nature of the
thing admits of; for we feel and act in the same manner as
we should do, if we believed that the objects of our attention
were real; which is the only proof that Metaphysicians pro-
duce, or can produce, of the belief which accompanies
perception. The author acknowledges, however, that in
most cases it is true that imagination is attended with no
belief, if by belief we mean a permanent conviction which
influences our conduct. But if the word be used in the
strict logical sense, he inclines to think, that the exercise
both of conception and imagination is always accompanied
with a belief that their objects exist. From a variety of ob-
servations, which we cannot rate within the limits of this
article, the ingenious professor infers, that when the concep-
tions of the mind are rendered steady and permanent, by
being strongly associated with any sensible impression, they
command our belief no less than our actual perceptions; and,
therefore, if it were possible for us with our eyes shut to keep
up for a length of time the conception of any sensible object,
we should, as long as this effort continued, believe that the
object was present to our senses. See Nominalists, Real-
ists, and Universals.

Conception, in Physiology, denotes the changes which
take place in the internal organs of generation of the female
sex, connected with the development and growth of the em-
bryo. See Generation.

Conception, in Animals, is said to be occasioned by
something emitted by the male, in the set of sperm, app-
proaching and uniting with the rudiments of an animule
contained in the female. To explain in what manner this is
effected, and to shew

"How the dim speck of entity began
To expand its recent form and stretch to man,

Garth,

has been the object of anxious inquiry from the earliest ages.
But though much learning has been expended on the sub-
ject, and several ingenious theories contrived, to explain the
mystery (see Generation), yet very little of real knowledge
has been obtained.

In this place, without deciding whether the male sperm
contains the animule, or only a phytic aura, giving life to
something engendered in the female, it will be sufficient to
observe, that the first effect of impregnation, or conception,
will be found in one of the ovaries, or female testicles, as
they are called (see Ovary), and not in the uterus, as was
generally believed. That the ovaries are necessary to conception, has been
long known, as is evident by the practice of foaming (that is,
taking out the ovaries of) cows and other animals, to
prevent their breeding. The late Mr. John Hunter took one of
the ovaries out of a cow (Ob. on the Animal Econ. 4to.),
and found the left off breeding two years sooner, and pro-
duced fewer pigs at each litter, than another cow, kept with
her, that was perfect. The perfect cow continued breeding
five years, and produced 162 pigs; the half-bated f.w.
continued to be fruitful only four years, and brought only
80 pigs: whence he concluded, that there is a certain limited
number of eggs in each of the female ovaries, and when they
are exhausted, the animal is no longer fit for conception.

Anatomists, in the course of their examination of the bod-
ies of females, have found hair, teeth, and other organised
parts in the ovaries; and ovary, containing fustules, have been
found in the Fallopian tubes. (See Fallopian tubes, also
Poetus extra uterin.)

On carefully examining into the contexture of the ovar-
ies, they are found to consist of clusters of vessels, like bunches
of grapes, which are supposed to be ova or eggs.
Whose one of the vessels, or eggs as they are called, be-
come ripe, it enlarges, and puts on a yellowish hue, and it
at this time it should be impregnated by the male sperm,
it bursts the thin membrane that confines it to the ovarium,
enters the ambrated end of the Fallopian tube, and thence
defends into the uterus.

The rent in the ovarium, through which the ovum had
palled, forms a cicatrice, which is called, from its colour,
corpus lateum. (See Corpus lateum.) On dissecting the
ovaria, there are always found, as many of these corpora
lutea, as the woman, the subject of the dissection, had borne
children.

While impregnation, or conception, is taking place in the
ovarium, and the fertilized ovum is descending through
the Fallopian tube, a process is going on in the uterus, to
prepare it for its reception. The vessels of the uterus, which
were before so extremely minute, as not to be visible, begin
to be conspicuous; the whole organ is enlarged, and a secre-
tion of a mucous takes place, and lines its internal surface.
This mucus soon puts on the appearance of a rough and
haggy membrane, defined to become the medium of con-
nection between the ovum and the uterus. The late Dr.
William
William Hunter called this membrane the decidua, because it is called off at the birth of the fetus. He was surprised to have first discovered it: but Needham, who published his "Observations de formato Foetu," in 1667, gives a clear description of it and of its office, but acknowledges that his account is taken from brutes; he never having had an opportunity of opening the body of a woman who had died undelivered. There are three membranes, he says, lining the uterus of viviparous animals when pregnant: "extima profusissima fibrosa eft, nulla vera, aut arteria vivilli donata." p. 170: it serves as a sheath, he says, to the other membranes.

Thomas Harvey describes it as still more distinctly. Before any vellige of the conception can be seen, he says, "mutur quaedam filamina tanguam anearanm tele, et uti fimo superiore cornu angulo ducentur: que famul juncta membranam ac mucilaginam tunica, live manticae vacuam ferment." Exercit. lexigraphus nova.

The ovum being received into the uterus, in a little time, pushes out small fibers, or vesicles, principally, perhaps, from that part by which it had been connected to its calyx in the ovarium, in a manner not dissimilar to that by which an acorn is joined to its cup, or a hazel nut to its outer green shell. These vesicles, piercing the decidua, which affords a support to them, infiltrate themselves into the pores of the uterus, and absorb the moisture from it, for the support and increase of the ovum, as the young fibres, or slender radicles of plants and trees, absorb their nourishment from the earth. Although the uterus is intended by nature, and is thus prepared for the reception of the ovum, yet if it happens to be detained in the Fallopian tube, or to fall into the cavity of the abdomen, it there puts forth its radicles, and attaches itself to the part it happens to fall upon, or be in contact with, and the inclosed fetus is nourished and comes to maturity nearly in the same manner, as if it had been received in its proper matrix. (See Poetus extra uterine, also Poetus, Nourishment of, in Utero.)

On examining the ovum, after its descent into the uterus, it appears to contain a clear glutinous fluid, like the white of an egg; in a little time, a concretion, like a small maggot, is seen in the centre of the fluid, which is the primordium of the embryo. Very minute blood-vesicles are now visible, branching upon a part of the chorion, heretofore to become placenta; the little galba, or maggot, being attached to it by slender threads, scarce a line in length, the future limbs umbilicalis. At one extremity of the cone three vehicles are seen, the rudiments of the eyes and brain; and beyond them, a crimson moving point, the gymnium sallis, or heart. Soon after, fine white flakes are perceived, variously circumvolved, the intellines. The result of the vescera are now faintly delineated; then the integuments covering and confining the vescera; then the extremities, or limbs, begin to sprout, at first short stumps, without hands or feet, which at length emerging, complete the transformation. The whole fetus is said to be completely formed, by the end of the fourth week from the time of conception. See Harvey, De Generat. Anim.: and his predecessor, under whom he studied at Padua, Fabricius ab Aquapendente. For the further development and growth of the fetus, see Embryo, and also Poetus.

Conception, Symptoms of, in Women. As soon as a woman hath conceived, a train of symptoms commence, which announce some considerable alteration has taken place. "Muiter ubi concipit," Hippocrates says, "alter in horreto, et inacxit, ad dentibus fluidet, et articulos reliquae unque corpus, convulso praebent, et uterum torpor." A woman, as soon as she has conceived, swells, and then becomes hot, her teeth chatter, and she suffers a light convulsive motion of her whole body. And in another place. "Perianatem mulierem, si alter non cognoscas, occult tracteri, et caviores sunt, et candidum umbilicorum albidum naturam non habet, sed lividum existim." Op. Om. cura Vard. Linden, t. ii. p. 245. In pregnancy the eyes become hollow, the whites of them lose their clearness, and become thick and muddy. If towards the end of the term of uterine gestation, he adds, the eyes become hollow, and the face and the whole body are affected with edema, if the tips of the ears and of the nose are white; and the lips livid, the child will be found to be dished or dead. Andreas Laurentius, who was physician to Henry IV. of France, recited the following circumstances, as indicative of a woman having conceived. "Ness mulierem concepisse eklammas," he says, "if in feminam concussum totum corpus leviter cohorruerit, aut titulatu quodam uterum contrahi persecipt; si exceptum cum voluptate semen non excitert; si uteri os internum exquisitum connivat; si mentura succinat purgatio; si lenis doloris fetus circa umbilicum et hypogastrum obrect; si mammis obscurate, extubenter, perdoleat; si sensis appetitum languecat; si oyssia lactatur, et su- bindae morae afficiatur; denique si in culdis falsixium." We know a woman to have conceived, if immediately after copulation she is affected with dizziness; if the fermen, received with pleasure, is not suffered to escape; if the mouth of the womb is found to be completely closed; if a slight faint of pain is perceived about the navel; if the ceases to menstruate, and the breasts become large, hard, and painful, if the appetite for venery abates; if she has frequent and sudden changes from mirth to sadness; and, lastly, if she has a loathing to her usual food, and a desire for things before indifferent, or to which she had an aversion. These observations are in general full, and may serve to shew the accuracy with which the ancients noticed the minute circumstances; but they are for the greater part such as we can make little use of in practice; as we should neither be permitted to inquire whether a superior degree of pleasure was felt at the moment of coition, or whether the fermen was retained, or to examine whether the os uteri was completely closed. Wearing, therefore, theses minutiae, it will be sufficient to describe the most usual symptoms attendant on conception and pregnancy, in the order they occur, and to make some observations on each of them, with the view of shewing the causes from which they are derived, and the means by which they may be mitigated, or appeased, when they are so violent as to endanger abortion, or are likely to occasion any permanent evil to the constitution.

The first symptom by which women judge themselves to have conceived, is an intermission of the regular discharge of the menes. This is so general, that women who have been accustomed to be regular, always date their conception from the time they first miss their courses, as they are popularly called; and in this judgment, they are almost constantly right, unless fever, or some other cause has intervened, to which the interruption of them may be attributed.

Nausea and vomiting are also pretty constant attendants on pregnancy. These are most troublesome in the morning, and often commence before the period for menstruation arrives. They have been supposed to be occasioned by the subdurance of the uterus into the pelvis, dragging part of the bowels with it. But as they come on before the uterus has obtained sufficient bulk to disturb the bowels by its weight, they are with more propriety ascribed to sympathy, between
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between the stomach and the uterus. Nausea and vomiting, unless uncommonly violent, are rather to be esteemed falutary than dangerous, and it has been observed, that women, attacked with these symptoms, are less liable to miscarriage, than those who are free from them. Blood has even been known to be thrown up from the stomach, from the violence of the vomiting, without any subsequent ill consequence. When, however, the vomiting is extremely violent, and obstinate, if there are also fumes of phlethora, or general fulness of the vesicles, two or three small bleedings have often proved falutary. In the mean while the body should be kept open, by administering gentle emetics, which the collective state of the bowels, incident also to pregnancy, renders particularly necessary. Infusion of fennel, with soluble tartar, or the bitter purging salt; kiesene diaphyr, rubarb, magnesia, or calfort oil, may be conveniently used, or emollient and opening glysters, administered advantageously for this purpose. In the relaxed state of the bowels, to which some delicate women are inclined, the confecio alkernes, or aromatica, given in weak cinnamon water, with three or four drops of the tincture of opium, twice or thrice a day, or from a quarter of a grain to a grain of opium may be given advantageously every night at bed time; where these have failed, the diarrhoea has been removed, by giving occasionally, in addition to the above, small doses of ipecacuanha; or, lastly, by change of air, all other methods having proved unsuccessful.

The disposition to vomiting usually ceases between the fourth and fifth month, or soon after the woman has quickened, (see Quickening.) The uterus now rising above the brim of the pelvis, and entering into the cavity of the abdomen, is less pressed upon by the neighbouring parts, and has more room for dilatation; perhaps also having been long used to the irritation, occasioned by the increase of the ovum, it is less sensibly affected by it. In some constitutions, however, the sickness and vomiting continue to harass the women through the whole course of pregnancy; yet even in these cases, although the vomiting is so incessant, that the whole of what is taken into the stomach seems to be ejected that way, yet such women have ordinarily as favourable labours, produce as healthy children, and recover from child-birth as speedily and completely as those who pass through their pregnancy with only the usual sickness.

Subsidence, or falling in of the abdomen, so as to be less prominent than usual, is considered as another of the early symptoms of pregnancy.

Dans une vntre plat
Un enfant il y a,
as the old French proverb has it. This has been said to be occasioned by the descent of the uterus into the pelvis, drawing with it a portion of the bowels, but with little propriety. The real cause seems to be emptiness of the bowels: Women not only vomiting up the greater part of the food they take in, during the first live or six weeks of their pregnancy, but being usually during that time so troubled with nausea, as to have little inclination to take fullness.

The aureola, or circle round the nipple, which in virgins is of a beautiful pink colour, becomes darker, it is said, after conception. It is certain, the aureola is darker in women who have had children, than in those who were never pregnant, and in some women who have borne many children, it becomes of a dark chocolate colour, but as that colour continues after child-birth, no indication can be taken thence, whether the woman is actually pregnant, unless perhaps with the first child.

Enlargement, hardness, and tenderness of the breasts, with pains darting through them, and a discharge of a thin pale milk, or whey, are commonly attendant on a pregnant state. This alteration in the state of the breasts usually takes place in the third or fourth month after conception, sometimes earlier, and is indicative of the preparation making in them for the secretion of milk, the future nourishment for the child. If from this plump and firm state, the breasts subside, and become bolder and flaccid, unless a violent diarrhoea may have superinduced to occasion it, the fetus may be expected to be weak, sickly, or dead.

Cardialgia, or heart-burn, is a frequent and troublesome attendant on pregnancy. (See Cardialgia.) This has obtained its name cardialgia, from its being supposed to be an affection of the cardia, or upper orifice of the stomach. A sense of burning, or of intense heat, melts the patient, which demands almost incessant drinking to appease it. As the uterus enlarges, it thwarts the intestines higher into the abdomen, hence the liver, and other viscera, are disturbed and straightened, and thence probably a more plentiful secretion of bile, which flowing into the stomach, is thought to occasion this uneasy sensation, which is observed to be more troublesome in a recumbent, than in an upright posture. Pills with spap and rubarb, Columbo root, magnesia, and other tafeless powders, are found to be the most useful medicines in this complaint. Milk and water, pyrnon and other chalybeate waters, barks and tonics are also serviceable; but it sometimes resists every medicine, and only subsides after the food is digested, and the stomach is nearly emptied. This points to the only preventive, abstinence. Women subject to this complaint should content themselves with the lightest diet, and that taken in small quantities. In the mean while, the rubarb, spap, and Columbo, should be perfused in to help digestion, and to cleanse and empty the bowels.

Cramp, attacking the legs, thighs, or belly, is also a frequent attendant on the pregnant state. This is probably occasioned by the pressure of the head, or other part of the fetus on the iliac or neighbouring nerves, and consequently becomes more troublesome the farther the woman advances in her pregnancy. An unnaturally irritable state of the nervous system seems to be the pre-disposing cause of this complaint. Hence, persons in the higher ranks of life, whose constitutions are dibilitated by sitting up late at nights, by large companies, luxuriant diet, &c. are most frequently tormented by it. A more simple diet, early hours, exercise in the open air, keeping the bowels empty, bark, and other bitter and tonic medicines, promise relief, both in preventing and curing this troublesome complaint.

Of the symptoms here enumerated, many are equivocal, as happening indifferently in the pregnant, or in the unm-pregnated state; and none of them are singly of sufficient validity, to enable us to form a decisive opinion from them; but from the conjunction of severa of them, a pretty certain conjecture may be formed. If a woman accustomed to be regular, soon after marriage ceases to be so, and about the same time is affected with nausea and vomiting, there would be little hazard in pronouncing such a person to be pregnant. But where the symptoms are equivocal, it is always best to defer giving a decisive opinion, until the commencement of the sixth month, when from the motion of the fetus, and the increased bulk of the abdomen, we may be enabled to determine with certainty.

About this time, a new train of symptoms succeeds, principally dependent on mechanical causes. The volume of the uterus, daily enlarging, presses on, and flattens the urinary bladder, and diminishes its capacity. Hence a more fre-
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quent necessity for making water. The uterus, at the same
time, pressing on the rectum, occasions the alvine faces to be
discharged with difficulty; hence colicomenes, and the re-
turn of the blood by the iliac and hemorrhoidal veins being
prevented, by the same cause, the piles; hence, also, e-
strumental swellings of the legs, thighs, and labia pu-
dendi.

The labia pudendi, swelling almost entirely of cellular
membranes, are sometimes so enormously dilated as to pre-
vent the person from walking, and occasion considerable
pain. Sacrificing the labia, or making two or three pu-
tures with a lancet, the parts being afterwards fomented
with warm water, sometimes succeeds in reducing these
swellings. Bleeding and moderate purges are also neces-
sary. However formidable the appearance of the labia,
when thus enlarged, may, in these cases, uncommonly ex-
pedite. In these phlegmopathic habits, the fibres seem
to have lost their tone or power of resisting, and to
give way to the slightest impulse, so that the child is fre-
quently expelled by the most trifling effort. The haemor-
rhoids, or piles, are not so tractable, but frequently elude
every attempt to cure them, until after delivery, when they
usually soon subside.

Varices, or enlargement of veins of the legs and
thighs, being dependent on the same cause, the pressure
of the uterus, preventing the return of the blood from the
lower extremities, can only be palliated, until after the
birth of the child, when they gradually vanish. It will be
right, while waiting for this event, to moderate the dilata-
tion of the veins, and prevent their burbling, by keeping in
a recurrent posture, and by wearing bandages around the
parts. The piles may be relieved by taking a fcrmt spoon
full of cream of tartrate every day, and by anointing them
with a preparation, consisting of galls of Aleppo reduced
to an impalpable powder, and mixed to the consistence of an
ointment with cold drawn linseed oil, or green tea, macerated
in boiling water, may be applied as a poultice.

An idea prevails among women, that it is necessary they
should take a greater quantity of nourishment during the
pregnant state, than at other times, as they are then to furnish
nourishment to an additional being; and they frequently, at
the exhoratation of their friends, take in a greater quantity
of food than they have any inclination for, lest they should
deprove the child of its necessary nourishment. But as no
more of the food they swallow can be of use for that pur-
pose, than what is properly digested, and as all the symp-
toms thaw the defluded state of the stomach, it is evident
that by loading that organ unceessarily, all the complaints
incident to the pregnant state will be aggravated and increa-
sed. The greater part of the bile being digested by vo-
miting, during pregnancy, a sufficiency does not remain to
complete the digestion of the food to which it greatly con-
tributes. Hence the chyle, admitted in too crude a state into
the intestines, by its limbus, excites after every meal a kind of
hectic, by which the body is emaciated, the face is con-
tracted, or shrunk, and the eyes, as Hippocrates observed,
become furred and hollow. In this state, therefore, an in-
creased quantity of food, by increasing the labour of diges-
tion, adds to the mischief. A moderate diet, with a due
quantity of vegetables, and of ripe fruit, with country air,
when it can be obtained, are the best remedies, and are to
be recommended in every case during pregnancy.

It has been observed, that the effusion of the menes is
one of the earlier signs of pregnancy; but some women
continue to have a discharge of blood from the pudenda,
recurring at longer or shorter intervals, for the first four,
five, or six months of their pregnancy; but the return of
these discharges is rarely regular, recurring at the end of the
second, third, or fourth week, and sometimes at the end of
longer intervals. The quantity also varies, being some-
times more sparry, at others more profuse than the menes
usually are. These discharges happen whenever any portion
of the placenta, or membranes, is detached from the uterus,
and generally terminate in abortion, or the premature birth of
the fetus; or if the woman carries her birth to the end of the
ninth month, the child is usually weak, sickly, or dead.

"St. pregnant," Hippocrates says, in the place last quoted,
"purges, purges given them from twenty to forty days, and
the child will have a fine, white, and healthy countenance.
A slender diet, with occasional small bleedings, and mild purges are the best pre-
ventives, in these cases.

Pica, or an irregular or depraved appetite, exciting
women to long for, or intensely desire, some particular kind
of food, is sometimes an attendant on pregnancy. (See Pica.
This formerly, from an improper indulgence of the ap-
etites and fancies of pregnant women, was a very trouble-
some, and sometimes a formidable affection; as not only the
health and life of the mother, but the perfection of the fetus,
were supposed to depend on gratifying these longings.
If a child happened to be born with some mark or blemish
on its body, the memory of the female relatives or friends
was raked, to recollect some f desire of the woman that had
been disappointed, to which the accident was attributed.
Sometimes, however, these marks were supposed to have
been occasioned by the sudden fright of some object, which
it was thought to resemble.

This idea of the power of the imagination of the mother,
in making or disfiguring the fetus, is so ancient that we can
trace its origin. We read in Genesis, that Jacob
placed peeled rods before the eyes when in company with
the rams, and it came to pass, that when the ewes looked
at the rods, that the lambs they yeancan, were party-col-
oured, and streaked. And Heidou, the most ancient of the
Greek poets, says, Ne que reddi e funere, libers
operam det, ne imaginatio rei trilis, in proles tranfaret,
safque permetat." Let no one returning from a funeral,
embrace his wife, lest the melancholy he had contrived,
should make an impression on the fetus. Dr. Daniel
Turner, who was an intire convert to the opinion, has made
a large collection of histories of monstrous births, all oc-
casioned, he says, by the disappointed longings of their
mothers, or by their being frightened by the sight of some
hideous or monstrous objects. See his Treatise, De Morbis
cutaneis. lib. xiii. Turner's book was answered by Dr.
Blondel, in a masterly and satisfactory manner. The op-
inion is now wearing away very fast, and bids fair in a little
time to be totally obliterated. See IMAGINATION.

When the appetite, during pregnancy, is inordinate or
depraved, requiring improper food, it may be remedied
by taking small doles of ipecacuanha, of rhubarb and mag-
nezia, of Columbo, and other bitter and tonic medicines.

CONEPTION, immaculate, of the Holy Virgin, is a feast
established in honour of the Holy Virgin; particularly with
regard to her having been conceived and born immaculate:
i.e. without original sin; held in the Roman church on the
8th of December.

The Latin church, says Gibson, (Hist. of the Decline
and Fall of the Roman Empire, vol. i. p. 265,) has not
disdained to borrow from the Koran the immaculate con-
ception of the virgin-mother. It is darkly hinted in the
Koran (c. 3. p. 39.) and more clearly explained by the
tradition of the Sonnites. (Sale's Note, and Maracci, ton.
i. p. 112.) In the 12th century, the immaculate concep-
tion
tion was condemned by St. Bernard as a presumptuous novelty. However Allatius, in his Prolegomena on Damascenus, endeavored to prove this to be founded on several churches in the East, as early as the eighth century. It was first established about the year 1135, though it is not known, with any degree of certainty, by what authority it was, introduced, nor in what place it was first celebrated; about 1140 certain churches in France began to observe it; but it had been observed in England, in consequence of the zeal of archbishop Anselm, before this period.

The church of Lyons in France was one of the first that adopted this new festival, but the canons of Lyons were severely confounded by St. Bernard for the innovation, and he vigorously opposed the immaculate conception of the Virgin, because it supplanted her being honoured with a privilege which belonged to Christ alone. Thus commenced a controversy, which occasioned two parties in the Christian church that contended with each other for several centuries.

This has been a great subject of controversy between the Scotists and Thomists; the former maintaining, and the latter impugning it.

The Dominicans espoused the party of St. Thomas, and held out a long time in defence of the Virgin's being conceived in original sin. When this controversy was renewed at Paris in 1384, by John de Montefono, a native of Aragon, a Dominican friar and professed of divinity, who publicly asserted that all who believed the immaculate conception were enemies of the true faith, the college of divines, and the whole university of Paris, condemned this, and some other tenets of Montefono. Upon this the Dominicans, together with their champion Montefono, appealed from the sentence of the university to pope Clement VII, at Avignon, (the name assumed by cardinal Robert of Geneva, on his election during the pontificate of Urban VI.) and raised an outcry, that St. Thomas himself was condemned by the judgment passed upon their brother. But, before the pope could decide the affair, the accused friar fled from the court of Avignon, went over to the party of Urban VI, who refuted at Rome, and thus, during his absence, was excommunicated. Whether or not the pope approved the sentence of the university of Paris is not ascertained. The Dominicans, however, deny that he did, and affirm, that Montefono was condemned merely on account of his flight; though there are many others who assert, that his opinion was also condemned. And as the Dominicans would not acknowledge the sentence of the university to be valid, they were expelled in the year 1389, and were not restored to their ancient honours in that learned body till the year 1404. The council of Trent, held in the decree of original sin, declares it not to be the intention of the council to include the Virgin under it; her conception it calls immaculate; and appoints the constitutions of Sixtus IV. to be observed with regard to it.

This controversy between the Dominicans and Franciscans was revived in the seventeenth century; and a festival was appointed by Clement XI. in 1708, to be celebrated throughout the Romish church; however, the Dominicans peremptorily deny the obligation of this law, and in maintaining their ancient doctrine.

In the three Spanish military orders of St. James of the Sword, Calatrava, and Alcantara, the knights take a vow, at their admission, to defend the immaculate conception. This resolution was first taken in 1562.

Peter d'Alva and Albarga have published forty-eight huge volumes in folio, on the mysteries of the conception.

Conception, Order of, in Germany, was instituted in 1618, by Charles de Gonzague of Cleves, duke of Nivernois and Rethelbois, and was confirmed by pope Urban VIII. in 1624. The badge of this order was a golden cross of eight points enamelled blue; in the centre a medalion rayonated gold, therein the image of the Virgin standing on a crescent, holding in her arms our Saviour, and round her head 12 stars all enamelled proper; the reverse was enamelled as the front, and on the medalion St. Michael, the whole of the star environed with the cordon of St. Francis, tie at the bottom: this badge was worn round the neck pendent to a sky blue ribbon.

Conception, religious of the order of. See Treatises.

Conceptionists, in Logic and Metaphysics, a denomination given to a party of nominalists, who took a middle road between the two sects of nominalists and realists, into which the scholastic philosophers were divided from the beginning of the twelfth century. That universality, which the realists hold to be in things themselves, and the nominalists in name only, the conceptionists hold to be neither in things nor in names only, but in our conceptions, whence they derived their appellation; but being exposed to the batteries of both the opposite parties, they made no great figure. It is not an easy matter, says professor Dugald Stewart (Elements of the Philosophy of the Human Mind, p. 193), to ascertain precisely the meaning of the conceptionists on the point in question, their language on the subject being involved and inaccurate; but the professor thinks that, upon the whole, it amounted to the two following propositions: first, that we have no reason to believe the existence of any essences, or universal ideas, corresponding to general terms; and, secondly, that the mind has the power of reasoning concerning genera, or classes of individuals, without the mediation of language. In denying the existence of universals, the conceptionists agreed with the nominalists. To what then, can we suppose, says the professor, that they differed from them, but about the necessity of language, as an instrument of thought, in carrying on our general speculations? Mr. Locke is referred by Dr. Reid (Essays on the Intellectual Powers of Man, p. 473) to the class of conceptionists. He does not maintain, that there are things which are universal; but that we have general or universal ideas which we form by abstraction; and this power of forming abstract and general ideas, he conceives, to be that which makes the chief distinction in point of understanding between men and brutes.

If Mr. Locke, says professor Stewart (ubi supra), had any decided opinion on the point in dispute, it did not differ materially from what is stated in the general propositions, which we have already cited. The apparent inconsistencies which occur in that part of his Essay in which the question is discussed, have led subsequent authors to represent his sentiments in different lights; but as these inconsistencies plainly shew, that he was satisfied neither with the system of the realists, nor with that of the nominalists, they seem to demonstrate that he leaned to the intermediate hypothesis already mentioned, notwithstanding the inaccurate and paradoxical manner in which he has expressed it. Dr. Reid's opinion seems to the professor to coincide nearly with that of the conceptionists; or, at least, to coincide with the two propositions, which are supposed to contain a summary of their doctrine. The absurdity of the ancient opinion concerning universals, as maintained both by Plato and Aristotle, he has expelled by the clearest and most decisive arguments; and by his own very original and important speculations concerning the ideal theory, he has, in the ingenious
ingenious professor's opinion, completely destroyed that natural prejudice from which the whole system of universal ideas gradually took rise. If, even in the case of individuals, we have no reason to believe the existence of any object of thought in the mind, distinct from the mind itself, we are at once relieved from all the difficulties in which philosophers have involved themselves, by attempting to explain, in consonance with that ancient hypothesis, the process of the mind in its general speculations. On the other hand, it is no less clear from Dr. Reid's criticisms on Berkeley and Hume, that his opinion does not coincide with that of the nominalists; and that the power with which the mind polishes of reasoning, concerning classes of objects, appears to him to imply some faculty, of which no notice is taken in the systems of these philosophers. However, he has no where positively asserted, that language is not an essential instrument of thought in our general reasonings. At the same time, as he has not affirmed the contrary, and as he has declared himself dissatisfied with the doctrines of Berkeley and Hume, his readers are naturally led to conclude, that this is his real opinion on the subject. His silence on this point is the more to be regretted, as it is the only point about which there can be any reasonable controversy among those who allow his refutation of the ideal hypothesis to be satisfactory. In consequence of that refutation, the whole dispute between the realists and the conceptuists falls at once to the ground; but the dispute between the conceptuists and the nominalists (which involve the great question concerning the use of signs in general speculation) remains on the same footing as before. See CONCEPTION.

CONCERT, an assembly of musicians, or a band of musical performers assembled for the entertainment of musical lovers. Concert Spirituel, Fr. A concert of sacred music, originally established at Paris in 1725, by permission of the abbot of the manager of the opera; which permission was purchased by the brother of the celebrated Philidor, to perform concerts in Lent, on the days the theatres were closed, at the price of 1000 livres a year, for three years, on condition that no French music or selections from the opera should be performed at these concerts. This first gave birth to the use of foreign music and foreign musicians in France. The license was renewed from time to time, but always at an advanced price, till it amounted, in 1749, to 9500 livres a year. In 1734, the two celebrated Bezzi's, from Turin, performed at the concert spirituel, one on the hautbois and the other on the bassoon, with more applause than any foreign musicians had ever before received in France. The celebrated Mondonville had the direction of this concert for several years, and composed expressly for its use motets for a single voice, accompanied by a rapid and difficult harpsichord leffon. It was at the concert spirituel, which, like our oratorios, takes place when no dramatic performances are allowed, that Giornovichi, La Motte, Vietti, the Agujari, Madame Mara, the Tod, Savoi, and David, were first heard in France; and afforded the inhabitants of Paris an opportunity of comparing the music and performance of foreign musicians with their own.

In 1749, during Lent, Gemignani had a concert of sacred music at Drury-lane theatre, the vocal pieces were all Italian to Latin words. Gemignani himself led the band on this occasion, and played one of his own solo's. This performance, in imitation of the French, was called Concerto Spirituale.

In Italy and Spain, academia, Ital. implies a concert. In France, Académie Royale de Musique was the title given at Paris to the establishment of the opera under Luilli by Louis XIV. in 1672, which it retained till the revolution. Roufseau, the foremost French musician and French musicians, translated both so much in his famous letter on French music, that he was burnt in effigy at the Opera-House door. And in the article Académie Royale de Musique, in the Encyclopédie, and Dictionnaire de Musique, he has given great offence by a pun; when after barely mentioning this academy, he only adds—\[I shall say nothing further concerning this celebrated establishment, except that all the academies in the world, this is that which has made the most noise;\] (le plus de bruit).
CONCERT-PITCH.

that on which the teenu-cliff is placed, being also the ledger-
line above the base flaff or the same below the-
treble staff of music, is now generally made the-
key-note, in finding the notes of the octave, whether diatonic
or tempered, we shall adopt each of the formulas, to the
finding of the pulses made by this note in ten fecon's of
time, to be determined by a hlop-watch, a second pendulum
clock, or a simple pendulum, used for the express purpose
of determining periods of 10th each. (See Pendulum.)
The first method was suggested by Pierre Mercier. It
consists in a wire or catgut string, of about 15 to 17 feet
length, over two fixed bridges at its extremities, and after
this, dividing the distance between the bridges accurately
into eight equal parts, then fixing another bridge at one of
those divisions from the end, taking care that the new
bridges, which should have a tolerably sharp edge or top,
does not strain the string, or force it out of its straight line.
The tuning-fork, pipe, or string C, upon the instrument
whole pitch is to be determined, is now to be compared
with the found of the 8th part of the string, and if its
double octave below nearly agrees therewith, the tension of
the whole string is to be altered, as in tuning a stringed
instrument, either tightening or slackening it, until the 8th
part is in exact unison with the double octave below the
note C, without any beats or undulations: if the found of
the 4th of the string should be found on trial to give a clear
musical note, and yet differ very materially from the double
octave below C, it may be necessary to assume a greater or
lesser length between the extreme bridges, and to deter-
mine anew the place of the bridge for the 8th part thereof;
and after the 4th part has been nicely adjusted to the double
octave below the note C, as above, it will be proper again
to compare the measure of the 8th part of the string with
its whole length, to see that the points of bearing on the
bridges are accurately adjusted to these proportions. Now
remove carefully the middle bridge, and cause the whole
string to vibrate, which it will be found to do so slowly,
as not to cause an audible sound, [if any found is heard, it
will be one of the Harmonics of that note, see that article,
and Trumpet], but so that its number of vibrations in 10th
can be found and counted, especially if a echo will be held
so near to the middle part of the string, that it may touch
it at each extremity of its vibration; 32 times the number
of these vibrations will give the number of pulses or com-
plete vibrations made by C in 10th, and may be called
its pitch.
The second method is that which Dr. Robison used,
wherein a machine, consisting of a combination of wheel-
work, could be so regulated by the motion of a fly, that
any given number of the teeth of a wheel should pass and
strike a quill projecting against them, during the space of
10th. In using such a machine as this, the velocity of the
last wheel should be so regulated, that the sound produced
by the impacts of the quill against the teeth, should be in
exact unison with the note C; when the known number of
teeth which strike the quill in the given time, will deter-
mine the pitch.
The third method is by the same learned and ingenious
gentleman, who contrived an apparatus, regulated in the
manner already described, which opened and shut the passage
to an even current of air, produced by a pair of bellows, such
as are used in organs, any required number of times in 10th;
this singular apparatus was found to give a clear musical
found, which regulated to an union with C, gave the exact
pitch thereof, by the number of alternate openings and
shuttings of the cock in 10th.
The fourth method is founded on the following propor-
tion, by the author herein mentioned, viz. "An open organ,
pipe, when sounding its fundamental note, undulates with
one node in its middle, and its undulations are analogous
in respect of their mechanism, with the vibrations of a wire
of the same length, and the same weight, with the column of
air in the pipe, and stretched by a weight equal to that of a
column of the same air, reaching to the top of a homoge-
ous atmosphere, or equal to the weight of a column of
mercury, as high as that in the barometer." (See Pipes.
Theory of the Sound of Trumpet, &c.) Whence this
simple practical rule, when the barometer stands at about
30 inches, and the thermometer at about 53°, viz., divide
the number 256620 by the length in inches and tenths,
of an open cylindrical pipe which founds C, and the quotient
will be the number of pulses or complete vibrations made
thereby in 10th.
The fifth method consists in suspending a known weight
(equal to W grains) at one end of a wire, such as is used for
the lowest notes of a piano-forte, the other end of which is
lapped round a thumb-peg, such as is used for tuning a viola,
screwed tightly into the mainfins, near to an instrument
whose pitch is to be determined; then by turning the peg,
lengthen or shorten the vibrating part of the wire, until
when struck it founds exactly a double octave below C;
measure exactly the length of the vibrating part of the string,
between its contact with the peg and the loop which lat-
tains the weight; call this L inches. After this, cut off
exactly L inches of this same wire and weigh it, call its
weight V grains; then will the number of complete vibra-
tions or pulses made by C in 10th be found by the following
theorem; viz. \[\frac{154463 \times W}{L \times W}\] See our article Cords.
The sixth method is by Dr. Robison, and is as follows.
Let a violin-guitar, or any such instrument, be fixed up
against a wall with the finger-board downwards, and in such
a manner that a violin-string, tained by a weight, may rest
on the bridge, but hang free of the lower end of the finger-
board. Let another string be tained by one of the tuning-
pins, till it be in exact union with C, then hang weights on
the other string, till upon drawing the bow across both
strings at a small distance below the bridge, they are found
to be in exact unison, taking care that the pressure of the
bow on the strings is moderate, as not to affect the tension
of the string fired tuned. Then, having noted carefully
the weight appended to the first string, add one-fortieth part
thereof to the same. Now draw the bow carefully again
across the strings as before, and an audible beating will be
heard between the sounds of the two strings; count the
number of these beats during 10th, and 81 times this will be
the number of complete vibrations, or pulses, made by C
in 10th.
The seventh method, as well as the base, depends on tun-
ing a major comma; for which several rules are given under
the article Comma. From the octave below C tune upwards
three successive perfect fifths upon a single flaps of an organ,
C G, D G, and D A; and thence tune downwards the per-
fected major fifth, A C; which last C will be a major comma
above the first C, and will be carefully counted when founded
therewith; count these beats during 10th, and 81 times this will
be the number of complete vibrations, or pulses of C
in 10th. See Dr. Smith's Harmonics, p. 195.
The eighth method (Harmonics, p. 197) consists in tuning
a major
a major fifth, C A, above C, not perfect, but such that it may beat sharp B times in 128; from thence tune downwards three times.

Every perfect fifth, A D, D G, and C G; which last note will be an imperfect octave below C, the beats of which octave are to be counted during 128, carefully distinguishing whether it beats sharp or flat, and calling the number, if sharp, S, and if flat, F; then will 81S + 16B, or 16B - 81F, according as the case may be, express the number of complete vibrations, or pulses of C in 100.

It is not in our power to give so satisfactory an account of what is the present concert or opera-pitch in this country, as we could have wished; but we hope that experiments will hereafter be multiplied, for fixing it very exactly (at a mean flat of the barometer and thermometer), and after such determination, that the exact number of pulses or complete vibrations from one extreme of the vibrations of a string until its return to the same point, will be reported to by instrument makers and tuners, for regulating the pitch of their forks, pipes, and instruments.

The vibrations, mentioned in M. Euler’s experiment, (after our fifth method, under our article Choixs) were semi-vibrations, or those made, while a point in a musical string, went from and returned to the axis, or line of rest, between the two points of fulgention, and not complete vibrations, or those made while the string went from and returned to the place of its greatest deviation from the axis: therefore \( \frac{392}{2} \) or 196, was the number of complete vibrations per 1", made by the A, a minor third below our C; whence this made \( \frac{6}{5} \times 196 \times 10 = 2351 \) complete vibrations in 100.

Dr. Robert Smith (Harmonies, p. 210 and 271), calculated about the middle of the last century, that the tenor clef C note, upon the organ in Trinity college, Cambridge, made 2322 complete vibrations in 1", or 2322 in 100, which, he says, was above half a mean tone lower than the London opera-pitch at that time, and which therefore probably gave about 2452 or 2470 pulses in 100. The above experiment of Dr. Smith’s was made, after Trinity college organ had been deprived a whole tone in its pitch, by making the keys each to act on two pipes lower in the scale than they originally did, by which it was reduced (Harmonies, p. 208, and 218) to the Roman pitch, or that to which the pitch-pipes, made about the year 1720, were generally tuned. Dr. Thomas Young, in his lectures at the Royal Institution (Syllabus, p. 97), states our C to make 256 vibrations in 1", apparently only, for the purpose of agreeing with an imaginary C eight octaves below, which is to make but 1 vibration in 1", but which imaginary C, according to the recent determinations of concert-pitch, which we are about to mention, ought to make but the \( \frac{3}{8} \) part of a vibration in 1", the 8th octave above which will be moved at the rate of 2400 puls in 10 seconds.

The late Dr. Robison applied our second, third, and sixth methods, for determining the complete vibrations made by C, and states them all to agree extremely near with 240 in 1", or 2400 in 100. Many other experiments are upon record, but generally some other note than C was selected for the experiment, the exact interval between which and C we are ignorant of, owing to the temperament of the inferior instrument; this is the case with Dr. Smith’s determinations (by the fifth and others of the methods above, Harmonies, p. 102, &c.) of the vibrations made by D 5/4 of a, upon the organ above-mentioned.

We were lately present at an experiment by Mr. John Isaac Hawkins, at his house in Great Titchfield-street, where he manufactures the finger keyed clav and double-bells, mentioned under our article CLAVILDE, (see FINGER-KEYED VIOL) according to our fifth method above: two pieces of hard wood, about an inch thick, were forced down to the floor in his room, at about 22 feet distance, and were pierced for the two string-peg of a harpsichord wire; several thin pieces of wood with a sharp edge at top, and rilled a very small height more above the floor, than the fixed pieces of wood, were provided as moveable bridges. A brass wire, called No. 15, by the piano-forte makers, and the largest size which they use in grand piano-fortes, which was found to be .023 inch diameter, was lapped on the pins, and stretched by turning one of them. From a point marked 0 on the floor, 8 or 10 inches from one of the fixed pieces of wood, the several distances .75 inches, .75, .70, .65, and .625 inches were carefully measured and marked under the string; a bridge was then placed under the string, at the point 0; another at .75, and another at .70, and one of the tuning pegs was turned until the short portion of the string, .65 to .75, was in perfect union with Mr. H’s small, or mouth tuning-fork, C; which is a very considerable improvement upon the large tuning forks which were to be fixed upon a table, (see Tuning-Fork.) the bridge at .75 inches was then successively moved to .70 and .65 inches, in order to compare the octave and double octave below with the fork, and which on trial appeared to be accurately in tune. This middle bridge was then removed, and the counting of the visible vibrations of the whole string, .65 to .75, or five octaves below C, was conducted as follows. Mr. H. kneeling down on one knee, placed a seconds watch before him, and held a quill with one hand slightly against the string, about two feet from the bridge, to see it to be struck by the wire at each vibration; this was for afflicting the ear, in counting the vibrations, by means of the audible strokes thus produced on the quill: for some time. Mr. H. continued attentively to notice the vibrations, and to beat down with his toe at every fourth vibration, as a performer on the violin, &c. does in playing in common time; this was purged, until such a regular rate of beating was obtained by the toe that the experiment was not interrupted by a new twitch or impulse given to the vibrating string by an aficionado; the counting then commenced, and was continued during 60 seconds, in the first of which 111 beats of the toe were made, and in a repetition of the experiment, after examining the time of the 8 1/2 part of the string, 113 beats were counted; the mean of these, or 112 per minute, gave 112 \( \times \frac{4}{3} = 6 \) = 74 vibrations for the whole string in 10 seconds, and consequently C, five octaves above, gave 475 \( \times 32 = 2380 \) vibrations in 100, which agrees extremely near with Dr. Robison’s experiments above mentioned, in showing, that 2400 may be taken as the present concert pitch.

We have only to add, that an experiment and calculation some years ago by the fifth method above, gave us 2415 puls in 100 for a tuning-fork then in our possession, marked C, but whether the fame had been adjusted to the acknowledged concert-pitch, we are unable to say. The rate of the barometer and thermometer should always be noted, at the time of making experiments of this kind, if it is intended accurately to determine the pitch: and it may be well, instead of trusting to the ear alone, in determining the unison or octave of the fork and string, to count and equalize their beats with a third found, a little different from both of them, as recommended by Mr. Nicholson, Phil. Journ. 8vo. i. p. 320, for the making of correct tuning-forks.

Concert
CONCERT of Ancient Music. This excellent establishment was originally suggested by the late earl of Sandwich in 1776, in favour of such solid and valuable productions of old masters as an intemperate rage for novelty had too soon laid aside as superannuated, was supported with spirit and dignity, by the concurrent zeal and activity of other noblemen and gentlemen of the first rank, who united their lordship in the undertaking. till 1787, when it was honourably closed with the presence of their majesties, whose kind attendance ever since has given to this institution an elevation and splendour, which perhaps to establishments of this kind ever enjoyed before. Here the productions of some of the old masters, particularly those of Purrell and Handel, are performed by a select and powerful band, with such correctness and energy, as the authors themselves never had the happiness to hear.

Concert, To, in a Military Style, is not only to deliberate upon, but to arrange, form, and agree upon plans of co-operation, for the purposes of either offence or defence.

CONCERTANTE, Ital. from concertare, to concert, order, arrange. In the musical technica, it used to be equivalent to harmonizing, adding instrumental parts to the voice. But at present, the term concertante is used substantively, for a symphony or full piece dialogised. In which there are solo parts for the display of great talents on particular instruments. At the concerts of Bach and Abel, solo parts were frequently allotted in these compositions to Cramer, Fétcher, the younger Stamitz, Hindemith, Sheldon, Holmes, Tacit, and the elder Florio. Abel, on the viol da gamba, and Bach himself on the pianoforte. Bach's concertante in C, and Phyle's in E, were always heard with delight; not only from the merit of the composition, but exquisite manner in which they were performed, and the ingenuity of the written cadences, generally furnished by Fétcher.

CONCERTATO, a term in Music, implying the addition of instrumental parts to the vocal composition; as motto concertato, a motet or anthem, accompanied by instruments.

CONCERTO, synonymous with concerto, which long supplied its place. Concerto and sonata implied nearly the same things in the days of Doccaccio, as concerto and sonata since; but concertare and concertanti were at first applied to the union of instruments with voices, in motets and madrigals, by doubling the voice-parts. It was not till late in the seventeenth century, that instrumental pieces of many parts, began to be called concertos, and of few parts sonatas.

The earliest compositions which we found in Italy, for three or more instruments of the same species, were Ricercari and Fantasia. But of these none seem to have been printed, when the elder Doni published the second edition of his "Libreria," 1557, as all the instrumental music that appears in his catalogue of musical compositions, which had then been published in Italy, are "Intabulature da organi, et da liuto, d'Anton da Bologna, di Giulio da Modena, di Francesco di Milano, di Jacque Dues, piu di dieci volumi, & continue." About the beginning of the seventeenth century madrigals, which were almost the only compositions in parts for the chamber, then cultivated, seem to have been suddenly superseded in the favour of lovers of music by a passion for fantasies of three, four, five, and six parts, wholly composed for viol, and other instruments, without vocal assistance. And this passion seems to have arisen, from the calling in of these instruments to reinforce the voice parts, with which they played in union, in the performance of motets and madrigals, thence termed concertati. At length the instrumental performers discovered that both the poetry and singing of the times might be spared without any great loss or injury to musical effects; as the words, if good, were rendered unutterable by fugue, imitation, and multiplicity of parts; and the singing, being often coarse and out of tune, could be better supplied by their own performance. Thus vocal music not only lost its independence, but was almost totally depressed by society; as the ancient Battou, calling in the Saxons to stuff them in their conflicts with the Poets, were themselves subdued and forced from their positions, by too powerful auxiliaries. See Fancies and Base-Viols.

Simpson in his "Compendium," speaking of fancies, page 118, says: "In my opinion, no action is equal to the English in this way, as well for their excellence, as for their various and numerous consorts of 3, 4, 5, and 6 parts, made properly for instruments, of which fancies are the chief."

In the MS. "Memoirs of Music," by the hon. Roger North, who speaking of Jenkins, an eminent English composer, in the time of Charles I., says, that "of all his concerts, none flew with his name to it, so universally, as the small piece called his "Five Bell Confero." And this is only in three parts, so that the import of the term concert or concerto was not then settled.

Montague, who travelled through Italy and Germany in 1750, says that the mas in great churches was accompanied by organs and violins. But though the word concerto occurs so early as the year 1587, in the "Trattenimenti," and "Divertimenti" of Scipio Bargagli, it was only applied to short Fantasia and Ricercari. Saini concertati was often used when instruments were added to voices, in concerti ecclesiastici.

At the latter end of the 17th century most of Baffani's, Corelli's and Torelli's violin music was composed for the church. The first and third set of Corelli's sonatas, and his first eight concertos, we are certain were thus appropriated. Samei, Veracini, and Tartini, composed their own solo concertos, and performed them likewise in the several churches of Italy. And Pugnani used to accompany the "Messa Bolla," or Silent Mass, at the chapel royal in Turin, with his violin solo concertos.

Concertos merely instrumental, for secular use, seem to have had no existence before the time of Corelli. The honour of the invention has been assigned to Torelli, but from no good authority. Six concertos by Alessandro Scarlatti, manifestly, from the gravity of their style, composed for the church, were printed by Benjamin Cook, in New-Street, Covent-garden, about the year 1730. But at the beginning of the last century, besides the concertos of Corelli, Geminiani, and Handel, concertos by Albinoni, Alberti, Tassanini, and Vitaldi, were dispersed all over the kingdom, and heard with great delight at our country concerts, music-meetings, and clubs. These were chiefly on the model of Torelli and Corelli, but with melody of a lighter kind. They were all in seven or eight parts for two choirs; that is, with solo parts for the concertini, or solo instruments, and ripieno parts for the concerto grosso, or choirs of the whole band. But these were soon superseded by great performers on the violin, such as Locatelli, Tartini, Somis, Veracini, Nerli, and Giordani, who, in order to display their superior powers of execution, rendered them too difficult for general use. But these being brought into public favour by the admirable performance of their several authors, were followed by the concertos of Bartelemon, Cramer, La Motte, Lollis, Solomon, Viotti, Giovanni, and others, who, by some peculiar excellence in the knowledge of the finger-board, use of the bow,
bow, or accurate performance of double-flows, seem to have arrived at the acme of perfection in executing solo concerts.

Concerto Grossi, a grand concerto, or full piece.

Concerts, public. These were first established in London by Banister, master of King Charles II's new band of 24 violins. The first notice we find of these assembles is in the London Gazette, No. 742, for Dec. 20th, 1672, in which there is the following advertisement: "These are to give notice, that at Mr John Banister's house, now called the music-school, over against the George Taverner, in White Yriers, this present Monday, will be music performed by excellent masters, beginning precisely at four of the clock in the afternoon, and every afternoon for the future, precisely at the same hour."

There are other advertisements from Banister of the same kind, in 1674, 1676, and 1678. In that for Dec. 11th, 1676, his musical performance is said to be "At the academy in little Lincoln's-inn fields," where it was to begin "with the parley of instruments, composed by Mr. Banister, and performed by eminent masters."

In Mr. North's manuscript "Memoirs of Music," we have a more minute account of these performances. "Banister having procured a large room in White Yriers, near the Temple back-gate, and erected an elevated box or gallery for the musicians, whose modelly required curtains, the roof of the room was filled with tents and small tables, alcove, and fountains. One shrilling, which was the price of admission, entitled the audience to call for whatever they pleased. There was very good music, for Banister found means to procure the best hands in London, and some voices to fill them. And there wanted no variety, for Banister, besides playing on the violin, did wonders on the flageolet to a thorough base, and several other masters likewise played folos."

These were followed by other public concerts of a superior kind, at the Crown and Anchor, the Colly in Pater-noster row, the Swan and King's Arms, Cornhill, York Buildings, Hickford's Room, &c. &c.

Concessi, q. d. I have granted; a term much used in conveyances, &c. Its effect is to create a covenant in law, as debi (I have given) does a warranty. Co. Lit. 384. This word is of a general extent, and is laid to amount to a grant, feufofitment, leaf, and release, &c. 2 Saund. 96.

Concession, in Rhetoric, a figure whereby something is granted or allowed to the adversary, either to prevent being detained by unnecessary incidents, or to make some advantage of. "I will not contend with you the reality of the contract; what I plea for, is relief against the injustice of it." "True, she is fair; but ought he not to shew her acknowledgments to heaven for the favour, by making a virtuous use of her beauty?" See Epitrope.

Concessit, Sur, in Laws, a species of Finc. in which fee.


Gen. Ch. Male flower not known. Female. Cal. one-leaved, flabby, trigonous near the bottom, with three large glands at its base, terminated by five thick acute teeth, each of which has on the inner side of its base a gland prelling upon the germ. P8. Germ superior, triangular; style none; fihmas three, thick, concave, furrowed, incurved. Peric. Capsule globular, trigonous, with three furrows, three-celled, three-valved, each valve dividing into two. Seeds, one in each cell, roundish, enveloped in a white pulpy matter which has a sweet pleasant taste.

Sp. C. guianensis, a small tree. Trunk ten or twelve feet high, about a foot in diameter, with grey bark and white wood, much branched. Leaves alternate, at unequal distances from each other, oval-oblong, acuminate, toothed, green and smooth on their upper surface, crenate underneath. Stipules in pairs, small, cadous. Flowers feathery, alternate, in a terminal spike, common peduncle fleshy, trigonous. A native of Guiana, on the banks of rivers. When the bark is cut, or the leaves torn, a greenish juice flows from the wound.

Concez, in Geography, a town of France, in the department of the Corrèze, and district of Drive; 6 leagues N.W. of Drive.

Conch, in Mythology. See Triton.

Concha auris, in Anatomy, is the hollow hollow of the external ear, included between the tragus, antitragus, and antehelix, and having at its anterior part the commencement of the meatus auditorius externus. See Ear.

Concha, Nervos, in Anatomy, a liquid measure among the Athenians, which contained two minima, or half an ounce. As much oil as it was capable of holding, weighed five drams one scruple and twenty grains, according to Cor. Defin. Phisic. Lex. & Eticonom. Others think that the concha contained two minima, or five spoons, which, according to Jacobus Sylvius, are equivalent to five drams. According to Galen, in his works De Ponderibus & Mensuris, cap. ii, the concha magna contained the same quantity with the acetabulum, which in liquid measure was an ounce and a half, and in weight fifteen grains. The concha minor was in liquid measure half an ounce, and in weight five Grains.

Conch, in Conchology. See Conchology.

Concha, in Music, a trumpet among ancient instruments, or a trumpet-marine, such as Triton used.

—— Tritona vocat; conchæque sonār
1upirare jubes.

Ov. Met. i.

Concha anatrida. See Anatrida.

Concha anamphora, the name of a fossil shell-fish, found in great abundance, and in a great variety of species, but not known in any of them living, on the shores or in the seas of our own or other countries. In Gloucestershire, and some other of our counties, these are found as common as pebbles on the ploughed lands in other places. They are a sort of bivalve shell, the valves of which are of unequal extent, both of them convex, and the head or back of the longer valve crooked, and falling over the head of the other.

The great general division of this numerous class of bodies, is into those which are of a smooth surface, and those which are of a striated or rough one.

Others also of the same class, or of one very nearly allied to it, are found in many of our inland counties, some very long from the cardo, or hinge, to the margin; and others very short, and very long the contrary way. They are found indiscriminately in all sorts of lands, in earth, in stone, in sand, and among gravel. See Anaxa.

Concha fortis, a name given by some authors to the genus of shells, called by others the Murax.

Concha globosa, the name of a large genus of shells, called by authors the Dolium, and in French the tonne.

Conch'n Lapide, was the name by which some
writers distinguished the fossil shells found lodged in the Aran
ta of the earth, before the whims of certain authors re-
secting the vis plicata, vis formativa, &c., by which they
attempted to account for the formation of these organic
remains, had been entirely exploded, and the truth of their
being animal exuviae generally established.

**Concha margaritifera**, a name sometimes used for those
mytili which produce pearls. See **MUSCUL**.

**Concha margaritifera**, is the name by which some
writers have described a fossil shell, somewhat resembling
the recent shells of this genus, in the equality of their valves,
the appearance of their gutted and toothed hinges, &c.

**Concha maritum**, in **Anatomy**, is a term applied to the
turbinate bones of the nose. See **SKELETON**.

**Concha specicorum**, in **Natural History**, the sp. fere shell,
a name given by authors to a species of volua, from some odd
figures described on its surface, representing rough droughts
of terrible phantoms. It is an elegant shell, of a middle fize,
and is of a white ground, and the figures are reddish; these
form three large and broad bands, surrounding the shell at
the top and bottom, and in the middle; and between these there
are several series of small spots. It is a scarce shell, and
usually sells at a large price.

**Concha Veneris**, the name by which several species of
chasam are called. The shell is univalve, wreathed,
and has a small longitudinal and denteculated chink, or
aperture, in it. It is also called conch porcellana, from
its aperture in some measure resembling the mouth of a
hog; and concha etyrbea, from its being found in the Red
Sea, called etyrbeum. It is also called concha etyriana,
from Venus, who received the epithet etyriana, from Cy-
thera, a Greek island. That this fish was used by the
ancients as an aliment, we read in Seneca, Ep. 95. Mund-
ius affirms that they prove a stimulus to venery, and pro-
voke urine. Rondeletius informs us, that these shells are an
ingredient in the filula de bellis, for removing fluxes,
and curing ulcers in the uterus. But instead of the concha
veneris, the apothecaries generally use cockles. Excellent
dentifrices are prepared from this shell, which is also used
for curing ulcers in the canthus of the eye, and the filula
lacrimalis. It is remarkably drying, without exciting any
heat.

**Concharum Promontorium**, in **Ancient Geography**,
a promontory of Asia Minor, on the Thracian Bosphorus.
It is the fourth part of the Cenchrean gulf.

**Conches**, in **Geography**, a town of France, in the
department of Eure, and chief place of a canton in the district
of Evry, 18 miles S.E. from Evry, 59 S. from Rouen,
and 87 N.E. from Paris. The place contains
2,459, and the canton 13,520 inhabitants. The territory
includes 27,753 kilometres, and 33 communes.

**Conches**, a town of France, in the department of the
lower Pyrenees, and district of Pau; 6 leagues N.N.E.
of Pam.

**Conchites**, or **Conchitix**, in **Natural History**, a
name which has been indifferentely used by writers, in de-
scribing fossil bivalve shells of different kinds.

**Conchites marmis**, a name given by the ancients to a
species of marble dug near Megara, and remarkable for
containing a great number of sea-shells, and other marine
bodies imderfed in it.

**Conchium**, in **Botany**, from κυκλος, a bivalve shell,
in allusion to the form of the fruit. Smith. Tr. of Linn.
Malmaison, 110. (Hakea; Schrad. Sert. 27. Cavan. Je. v.
6. 24.) Muscule shrub. Cliffs and order, tetrandria mono-

Gen. Ch. Cal. none. Cor. of four petals, linear, cohere-
ing at their base, somewhat dilated and concave at the stam-
nit in, nearly equal. Stem. four filaments short, inserted to-
wars the summit of each petal; anthers lodged in the ca-
vity of each petal, erect, oblong, two-celled. Pfl. Ger-
men superior, small, ovate, oblique; style ascendine, re-
curved, cylindrical, thick, as long as the corolla; stigma
turbinate, pointed. Petal. Capula ovate, oblique, gibb-
ous and rough, pointed, of two hard, thick, woody
valves, and one small eccentric cell. See C conches, two,
 elliptical, flat on one side, convex on the other, filling the cavity of the
capula, each furnished with a black, membranous, transverse, oblong wing.

Eff. Ch. Calyx none. Petals four, bearing the stamens.
 **Silviasa turbinate, pointed. Capulae**, of one cell. **Seeds** two,
winged.

Sp. 1. C. gibbosa, Donn. Cant. 21. (Bankia gibbosa; 
Hakea gibbosa; Cavan. Le. 1. 534. H. pateceas; Schrad.
Sert. 27.) "Leaves cylindrical, slightly downy, rather
longer than the fruit. Corolla' mouth. **Capulae roundish-
ovate, gibbous, rough." Sm. MSS. Stem shrubby, branch-
ed, rigid, smooth. Young branches hairy. Leaves
numberous, evergreen, alternate, fesfle, spreading, cylindrical, near two
inches long, somewhat downy; especially when young, each
 tipped with a sharp spine. **Flowers** in small, axillary, hairy
whites. **Corolla** nearly or quite smooth. **Capulae**
solitary, the size of a walnut, black and rough, very gib-
bose underneath; the valves extremely thick, hard and
woody, each tipped with a short sharp point; cavity very
small, eccentric, uneven, of a mahogany colour. **Seeds** with
black wings like gauze or crane. A native of New South
Wales, near Port-Jackson. It is now frequent in the more
curious European green-houses, but is rather singular than
beautiful. 2. C. spheroidea. "Leaves cylindrical, as long
as the fruit, downy as well as the branches. **Capulae** orbi-
cular, depressed, smoothih." Sm. MSS. A smaller shrub
than the last. **Branches** clothed with dense woolly hairs.
**Leaves** about an inch long, very hairy. **Flowers** unknown
in Europe. **Capulae** of a rusty brown, the size of the leaf,
but much less rugged, and when viewed vertically, almost
orbicular, their points scarcely extending beyond the cir-
cumference. Sent from Port-Jackson with the preceding.
aison. (Hakea fibresa; Schrad. Sert. 27.) **Leaves** cylin-
drical, smooth, as long as the fruit. **Corolla** smoothish.
**Capulae roundish-ovate**, rugged, elongated at the point." Sm.
MSS. Like C. gibbosa, but in all its parts about half as
large. **Leaves** in every period of their growth quite
smooth. **Flower-flaps** and young branches silky. **Fruit**
more oblong than in the two preceding, but its lateral pro-
tuberances are more globose. A native of Port-Jackson,
not rare in our gardens. 4. C. longifolium. Donn. Cant. 21.
(Bankia teretifolia; Salib. Prod. 517.) "Leaves cylin-
drical, smooth, thrice as long as the fruit. **Corolla** cloth-
ed with silky hairs." Sm. MSS. **Leaves** three inches or
more in length, fleshy, as in all the foregoing, always
smooth, as well as the branches. **Corolla** clothed with white,
close, silky hairs. Perhaps only a variety of C. pugioni-
forme hereafter described, which cannot be determined to
the fruit of the present species be known. 5. C. compres.
a. "Leaves cylindrical, smooth, scarcely so long as the fruit.
**Capulae** ovate compressed, somewhat rugged." Sm. MSS.
The fruit of this is not more than an inch long, and ovate,
pertaining but little of the globular protuberant figure of the
preceding kinds. **Leaves** small and slender. 6. C. pugio-
forme. (Hakea pugioniformis; Cavan. Le. v. 6. 24. 1.
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Properly and Culture. All the species are shrubby and perennial, chiefly raised from seeds brought in the capsules from their native country, and requiring with us only the usual shelter of a green-haue or conservatory. Those from King George's Sound are as yet strangers to our gardens. The others thrive in sandy peat earth, but require regular and rather copious supplies of water. They may be increased by cuttings. C. fallicn timens feeds in abundance when planted in the ground under glass, and ricks to the height of 12 or 15 feet.

CONCHOID, or CONCHILIS, in Geometry, a curve line which always approaches nearer a straight line to which it is inclined, but never meets it. It was invented by Nicomedes, and much used by the ancients, as we learn from Pappus, in the construction of folid problems.

It is described thus: to draw a right line B D (Plate, Analysis, fig. 2) and another AC, perpendicular to it in E; draw the number of right lines, as CM, CM, cutting B D in Q, make QM = QN = AE = EF: the curve wherein the points, M, M, are found, is the conchilis, or conchis prima, so called by Nicomedes. The other, wherein the points, N, N, are found, is the conchis secunda; the right line B D the rule, or directrix, the point C the pole, or centre of the conchoid. In reality, they are both parts of the same curve, having the same pole C, and four infinite legs, to which the line B D is a common asymptote. The inventor also contrived an instrnent, whereby the first conchoid may be described mechanically thus, in the rule A D (fig. 3.) is a channel or groove cut, so that a smooth nail, firmly fixed in the moveable rule C B, in the point F, may slide freely within it into the rule E G is fixed another nail in K, for the moveable rule C B to slide upon. If then the rule B C be so moved, that the nail P passes along the canal A D; the frlle, or point in C, will describe the first conchoid.

Now let A P = x (fig. 2); A E = a; P E = M R = a - x; wherefore, as x increases, a - x, or M R will decrease; and therefore the curve continually approaches nearer to the rule B D.

In the same manner it appears, that the right line N O multi continually decreases; and therefore that the second conchoid, also, multi continually approaches nearer the rule.

But so much as between each conchoid and the right line B D, there will be the right line Q M or Q N, equal to A E; neither of the conchoids can concur with the right line B D: consequently B D is an asymptote of each conchoid. See Asymptote.

If from any point, A, of the curve (fig. 4.), A H and F T P be drawn perpendicular to the rule, or directrix, H T, and A L parallel to it; and if the quadrant, FG K, be described interciting A L in G; we shall have P L \times L G = T I \times L A. For the triangles, A H B, T L G, are similar and equal, as the angles at H and L are right; and A B = T F = T G, and A H = T L; therefore B H = G L. Also the triangles, A H B, A L P, are similar. Whence A H : H B :: P L : A L; that is, T L : G L :: P L : A L; therefore, P L \times G L = T L \times A L.

Hence, the same thing being supposed, we shall have A G = B T, and G L = H B. For A L = H T, and G L = H B.
\[
\begin{align*}
= HB; \text{ therefore, by subtraction, we shall have } AC &= BT. \text{ This proposition is equally true in the inferior conchoid (fig. 5). In the inferior conchoid } g l = b b. \text{ Moreover, in the superior conchoid (fig. 4), if } PTF \text{ and } AH \text{ be perpendicular to the directrix } HT, \text{ and } AL \text{ parallel to it, } TL^2 = TF^2 - AH^2 : PL^2 : AL^2. \text{ For, by the preceding proposition, } TL = GL = PL = AL, \text{ and } TL' = GL' = PL' = AL'. \text{ But } GL' = GT^2 - TL^2 = TF^2 - AH^2 : PL^2 : AL'.
\end{align*}
\]

Hence, putting } FT = a, PT = b, \text{ axis } TH = x, \text{ ordinate } HA = y = \text{ the equation of the superior conchoid will be }
\[
\frac{b + y}{\sqrt{a^2 - y^2}} = y = AL, \text{ or, by reducing }
\]

\[
it, \text{ we shall have } b + y = y = \sqrt{a^2 - y^2} = x = AL, \text{ and, by reducing }
\]

\[
2b^2y + 2a^2x - y^2 = x, \text{ or } \sqrt{a^2 - y^2} = y = x, \text{ and } a^2b^2 + 2a^2y + a^2y^2 - b^2y^2 = b^2 = y^2 = y = x; \text{ whence, by transposition, we shall have } y^2 + 2b^2y + b^2 - a^2y^2 + x^2 - 2ab = a^2b^2. \text{ Thus also, in the inferior conchoid (fig. 5), if }
\]

\[
pt \text{ and } ab \text{ be perpendicular to the directrix } bt, \text{ and } al \text{ parallel to it; we shall have } tf = t = a^2b^2 : PL = a^2. \text{ For } tl = gl = PL = a^2; \text{ and } tl' = gl': PL = a^2: \text{ but } gb' = gb = a^2 - a^2b = t = a^2; \text{ therefore } tf = a^2 = a^2b = PL = a^2.
\]

Hence putting } tf = a, PL = b, \text{ axis } tb = x, \text{ ordinate } ha = y = \text{ the equation of the inferior conchoid will be }
\[
\frac{b - y}{\sqrt{a^2 - y^2}} = y = a. \text{ And, when reduced, } y = \frac{a}{x}, \text{ it may be from the equation of the other curve by merely }
\]

\[
2b^2 + 2a^2 - y^2 = x = a^2. \text{ Or, it may be from the equation of the other curve by merely }
\]

\[
\text{changing the sign of } y, \text{ which in this case is negative.} \]

\text{Of the whole conchoid, expressed by the two equations, or rather by one equation only, with different signs, there are three classes of species; as first, when } E < F \text{ is less than } E C, \text{ as in fig. 2; when } E F = E C \text{, as in fig. 6; and when } E F > E C, \text{ as in fig. 7, in which latter case the conchoid is called nodated. The same equation holds for this nodated conchoid, the whole difference being merely that } a \text{ is here greater than } b.
\]

\text{Sir Isaac Newton approves of the use of the conchoid for trisecting angles, or finding two mean proportionals, or for constructing other solid problems. To this purpose, he says, in the linear construction of equations towards the close of his "Universal Arithmetic:" "The ancients at first endeavoured in vain at the trisection of an angle, and the finding of two mean proportionals by a right line and a circle. Afterwards they began to consider several other lines, as the conchoid, the cissoid, and the conic sections, and by some of these to solve these problems." Again, "Either, therefore, the conchoid is not to be admitted at all into geometry, or else, in the construction of problems, it is to be preferred to all lines of a more difficult description; and there is the same reason for other curves; for which reason we approve of the trisecting of an angle by a conchoid, which Archimedes in his Lemmas, and Pappus in his Collections, have preferred to the invocations of all others in this case; because we ought either to exclude all lines, besides the circle and right line, out of geometry, or admit them according to the licency of their descriptions, in which case the conchoid yields to none, except the circle." Lastly, "that is arithmetically more simple which is determined by the more simple equations; but that is geometrically more simple which is determined by the more simple draw.
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\text{CHONOEY. "The study of shells, or telluric animals," it has been well observed by a plain, but ingenuous writer, "is a branch of natural history, though not greatly useful in human economy, yet perhaps by the infinite beauties of the subjects it treats of, is adapted to recreate the senses, and infallibly lead the amiable admirer into the contemplation of the glory of the Divinity, in their creation." Or, in the more harmonious periods of the poets, we would say,

"Each shell, each crawling insect holds a rank Important, in the plan of him who framed This scale of beings;" —Stillingfleet.

Shells appear to form a part of the creation not immediately subservient to the purposes of human life. This is granted; but they are a link in the great chain of nature; they constitute a department of rational inquiry worthy the rehearted of the man of science; and when we consider the amazing diversity of singular and beautiful objects they embrace, in full, we are persuaded, as cannot fail to arrest in a particular degree the regard of every common observer.

A late writer, whose talents we respect, affirms, in undisguised terms, that the pursuits of the conchologist are frivolous, and tend to no useful purpose. For the credit of the philosophical inquirer, in this pleasing department of natural knowledge, we could wish to see this opinion controverted. We shall not indeed endeavour to support the pretensions of conchology to a distinguished rank among the more beneficial pursuits of science, but we do not fear to prove it in a pre-eminent degree entitled to the attention of every contemplative mind. In the present enlightened period, it is not, we should conceive, incumbent to offer any argument in its behalf, because we are unable to prove its utility in the common acceptance of the term. We are not, for this reason alone, to esteem it frivolous; or, in a word, to declare that our ideas are entirely absorbed in the contemplation of interrelated views and the love of wealth, or that we are fudicious only to gratify our immediate wants. Our untaught ancestors cultivated the oak, we are told, that they might eat acorns, regardless of the importance of the parent timber; but we are not to imitate their example, and deem it trifling to cultivate any branch of natural science, that is unlikely to afford us some direct benefit; nor are we to be content with ascertaining what may be merely useful as food for ourselves, or fodder for our cattle. How unworthy would this be of the refined conceptions and dignity of intellectual men? But we are convinced that a more enlarged and liberal idea of this subject will be conceived on the rightest reflection by every intelligent mind; that the science of conchology will be hereafter more successfully pursued in this country than it has hitherto been, and that the observations we have to offer as we proceed, though less abstruse than the science may seem to demand, will to a certain extent facilitate this desirable object.

One clear and most important fact, the truth of which we would wish to impress on the mind of the reader, should be premised, that whatever opinion we may form on this sub-
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All tellaceous animals are composed of two parts; one of which, the animal itself, is soft and mol luscous; the other is the shell, or habitation, which is hard, of a flinty or calcareous nature, and either partially or entirely covers the animal. The animal is attached to the shell by means of ligaments or muscles.

It was long considered as a matter of dispute among naturalists, whether the arrangement of shells should be constituted from the animals or their habitation. No one can deny, that if we proceed on principles strictly scientific, we must regard them as a department of zoology, and should, on that account, dispose them according to the nature and structure of the animal. But the classification formed from the characters of the shells is universally followed, and we must confess too, is for many reasons preferable to any other. Neither is it, in the hands of the skilful conchologist, attended with so much indecision, as might be generally imagined.

In the first place among the vast variety of shells hitherto discovered, how small comparatively is the number of those, whose whole animal inhabitant is described or known. It is not of species only that we speak, but of whole natural families or genera, not a single species of which has been yet discovered with the animal appertaining, so little are we acquainted with the mol luscous orders, or animals inhabiting the shells. Of the shells we daily see in collections few are filled up alive, the far greater number are found on shores, dead or empty. Neither, if it were otherwise, are accurate descriptions of animals whose parts are not easily seen, or anatomical investigations, which are in many cases necessary, within the capacity of every one. Many of their parts, and their respective functions, are not to be ascertained, except by comparative analogy, and which in itself presents an insurmountable difficulty, or a field of critical inquiry to extensive and complicated that few, even with the ability to pursue it with success, could be prevailed upon to devote that attention to the subject which it requires.

Hence it becomes impossible to arrange the far greater number of tellaceous productions by the animals; the attempt must ever prove unsuccessful. Our arrangements would be partial, and three-fourths of the shells known must be either excluded from the system, or be placed at hazard; and of course without order or connection with those whole animals we are acquainted with. The latter are chiefly such as are confined to the coasts of the European seas, and some of the terrestrial and fresh water kinds, which, from their abundance and locality, have obtruded themselves upon the investigations of the naturalist. Even our knowledge of those is exceedingly imperfect. For those of the extra European species, we are indebted chiefly to Adanson, Rumphius, Argenville, and Pauvage, and for the anatomical dissection of various European kinds to Valentini, De Heude, Lister, and Mühler. The investigations of Poli on the shells of the two Sicilies are valuable, in this respect, as also are the observations of Lamarck, and Cuvier, and we may also add Olivier; but what is the amount of all these discoveries, we would ask, in enabling us to form a system of conchology.

The best characters upon which to found all systems of natural history, must be those most obvious and accessible. All ranks of animals, as nearly as can be with convenience, should be arranged by apparent and external characters. While we study shells, without regarding the animal, we are aware they are but considered partially. The animals that inhabit them should guide us in our researches; they alone are the fabricators of the shell, and the shell is only their habitation, to which they give the form, the bulk, hardness,
hardness, colours, and all the peculiarities of elegance we admire. If we were to examine these new and almost unknown objects, we should discover a number of peculiarities as remarkable for their structure as for their functions, and an infinite variety of curious and interesting particulars relative to their general habits and manners of life. It is a subject worthy of the serious contemplation and attention of the naturalist, and should never be neglected when an opportunity offers. But a system of conchology, founded entirely on the structure of the animals, must, we cannot hesitate in affirming, ever remain one of the desiderata of natural science.

In the superficial arrangement taken from shells alone we are not exempt from difficulty. Shells vary exceedingly in form and colour in the different stages of their growth, and in this case we should sometimes derive material assistance from our knowledge of the animal. Young shells have been described as specifically distinct from the parent or older shells by many writers. It indeed requires a greater degree of caution in determining the species, nay even genera, of shells in the different periods of growth than may be imagined; of this we could adduce many very remarkable instances, a few it may be necessary to mention to guard the common observer from forming hasty, and erroneous conclusions.

Many of the epiphragms, or cowries, when young, have the appearance of a volute, the thick dentilicated fold of the exterior lip being wholly wanting, and the column being only partially plated as in the true volutes. The young of the slotted shells, in general, are delirious of that broad expansive, or furcated lip, called the wing. The spires in many of the turrited kinds of shells, when young, are blunt; obtuse, or terminated in a large globular head, exceeding the size of the whorl beneath; but as the shell advances in growth, it develops itself, extending in a spiral direction, and thus in the old shells the number of spires is greater than in the young ones. The variations in the growth of the patella tribe are often so considerable, as to amount to the critical observer to determine them. Still however the conchologist by the dint of application, and nice determination, will be at leisure to fix on certain characters peculiar to every species, and be, by that means, enabled to decide on the species of a shell under every stage of growth.

Linnæus considers the structure of the shell as well as the shell in all his general distinctions; the idea is excellent, and we should approve the design, but the object itself is unattainable; a lamentable proof of which pretexts itself to view, when we consider the number of those very animals which he describes that have been ascertained, by recent observations, to be of a very different nature and structure from what he conceived. This error may be easily accounted for when we reflect that the judgment of Linnæus was guided in many inferences by analogy, and that the different figures, extent in various ways without himself purposing the means of determining their accuracy, or imperfection. We intend nothing to the disparagement of Linnæus in this respect; the structure of the animal was of too much importance in his mind to be omitted, and he availed himself of the best sources of authority within his power, some of which, it has since been proved, are not so accurate as we could wish, and others altogether erroneous.

From all that has been advanced on this topic, the refult will be obvious, that teltaceous bodies may be conveniently arranged, or, in other words, can only be arranged by the organization of the shell; that the primary character must be taken from the shell because this we are acquainted with, while the animal is oftentimes unknown to us. But that the structure of the animal should be regarded in the construction of genera, when it can be ascertained; as a secondary consideration to guide us in the formation of new genera, or in correcting the old, as opportunities of investigating them occur.

Having defined the meaning of a teltaceous animal, and endeavoured to prove that the structure of the shell is the most material object to be regarded in a primary view, we shall proceed next to an elementary elucidation of the several parts of which it is composed.

In conchology, as in any other science, the student must necessarily acquire, in the first instance, a distinct knowledge of the terms employed. These, except such as relate to subordinated characters, or specific distinctions, and which require no explanation in this place, may be simplified and reduced to a small number. In the selection of these terms we can abide by no one particular authority; we must be general, deriving our terms from various sources, or inventing new ones. Hitherto in treating on the different articles of conchology, in the progress of this work, it has been our aim to adhere as nearly to the authority of Linnæus as possible, referring to ourselves an opportunity of expressing our own sentiments under the present article, and laying generally these points upon which we principally differ in opinion from that author. This will appear more fully in our review of his genera. Our attention is at this time confined to the terms employed in describing the several parts of shells, and as it is well known that Linnæus laid down a series of terms for this purpose, it will be expected that we should not pass over them in silence. Upon this subject we shall however only trespass lightly. We would willingly adopt those established by Linnæus, in his "Fundamenta Tellacologini," and other writings; but it must be confessed, with all our respect for the talents of that naturalist, his terms are inadmissible. The wanton of his admirers, and we must, on many occasions, profess ourselves of that number, will not peruse the definitions he has given of the bivalves, of his venus, and some other bivalve genera, of his venus dione, and also of several univalves, without admitting that much of the Linnæan phaenology on this subject is neither applicable to the parts intended, nor if it were, such as modestly would allow us to retain; and that to expunge them is only a necessary sacrifice which the chality of science imperiously demands. Delicacy will pardon the allusion, and defer no further explanation.

All shells or teltaceous bodies hitherto discovered, may be divided into three principal tribes, and which, after the Linnæan manner, may be denominated Multivalve, Bivalve, and Univalve.

Any external part of a shell being of a teltaceous substance, and either itself, forming a shield or covering for the animal, as in univalves, or in union with another, or others connected by ligament, cartilage, hinge, teeth, or other fastenings, is denominated valve; in dehiscing the several parts of a single piece, are called univalve, those of two parts bivalves, and those of many parts multivalves. Between bivalve and multivalve no distinction is drawn, shells consisting of more than two such parts, being called multivalve, without any regard to the number. An amendment is proposed by some of the French writers, in a new order under the name of trivalve.

Shells of the simplest form are arranged by some naturalists in the first class, from which they proceed progressively to those possessing the greatest number of valves, and being of the most intricate structure. This is an ancient, and very simple
simple mode of arrangement, and has its advocates in the present day. Linnaeus reverses this order by beginning with the chiton, lepas, and pholus, which are shells of the multivalvate and molten complex structure, and ending with those of the simplest form. We cannot avoid thinking the former preferable, and shall adopt it in the present instance.

Explanation of the Parts of Shells with Reference to the Elementary Plates of Conchology.

Univalve.

In the examination of a shell of this order, the contour, or outline, is the shell particular to be regarded. By this the conchologist is guided in his definition of simple, spiral, or multivalve shells, (as the Linnaean school divides shells, univalves with a regular spire, and multivalves without a regular spire); discoid, flattened, or tubed shells; those with smooth or uneven asperities; the ventricose, labiate, rostrate, rolled, and many other distinctions, all which strike the eye at the first view. It is indeed, by attending to the contour, that the principal distinctions in shells of this kind are at once perceived, taking into consideration the back and front profile at the same time. Some few shells, as the nautilus pompilius, and others of the same family, have the spire revolving internally, in which the outline offers its assistance in the primary definitions, but the number of such shells is very small. Next to the profile of the shell, the structure of the mouth, the pillar, and expansion of the inner lip, the gutter or canaliculation, and the umbilical opening, and operculum if any, are to be considered, and lastly the work on the outer surface, as well as the colours with which it is embellished.

The base or bottom of the shell we consider that part upon which it rests when supported in an erect position, with the summit or tip of the spire standing vertically. In such shells the tip is called the apex. The course of the spire or wreath is from the left to right in most spiral shells, some few only being of the reversed or heterotrophous kind, the whorls of which are in a contrary direction. When speaking of the right and left sides of a shell, it should be understood as having the aperture downwards, and it will be then seen that in most shells the aperture or opening is on the left side, i.e. facing the right hand of the spectator.

Bafe, the tip of the lowest end of the shell, at the extremity opposite the apex of the spire; in the rostrate kind of univalves it implies the tip of the beak. Some say the shell rests on its base when laid upon a flat surface, with the mouth downwards; this is not correct, except in the patella tribe, and some other univalves which have no regular spire, as the dentalium, &c. The base in several shells is denoted in the Plate, Conchology, fig. 1.

Apex, the summit of the shell. Fig. 2.

Front, the face of the shell with the aperture placed directly in front of the observer. Fig. 3.

Back, that part of the shell which is immediately opposed to the preceding. Fig. 4.

Side, the parts seen longitudinally in profile, to the right and left when the shell is viewed either in a front or back position. Fig. 5.

Body, of the shell, (corpus) the first whorl of the spire at the base. Fig. 6.

Belly, is to be distinguished from the body as it implies only the convex, or swollen part of the first whorl, formed by the convexity of the aperture near the lip. Fig. 7.

Wlroir denotes one of the wreaths, turns, or volutions of the shell. Fig. 8.

_Spicer_, comprehends, in a general sense, all the whorls of the shell, the first or body wreath excepted. Fig. 9.

The form of the spire is of great consideration in the definition of shells, as it affords a prominent and distinguishing character; it is in general flat, thence somewhat depressed or elevated; sometimes convex and slightly pointed; or with the point obtuse; or much elevated and ending in a point; plano-concave, prismatic, subulate, or truncated. Mr. Adamson observes that the disposition of the spires varies according to the plane they turn on, which is either horizontal, cylindrical, conic, or oblique. The he conceives to be the four principal divisions of the spires, but admits there are many intermediate formations. The number and form of the spires vary in the same species, in their different growths. Young shells have commonly a less number than the old ones, neither have shells of the same age always the like number of spires, a circumstance attributable to the effects of sickness, or the difference of sex. Thus in some multivalve shells we perceive that the males have the spires less numerous, smaller, and of a more lengthened form than in the females.

_Suture of the spire or whorls_, is the spiral line which separates the whorls, and which is sometimes foliated, crenated, or somewhat projecting. Fig. 10.

_Piller or Columella_, is the inner part of the left lip, or column, which runs through the shell, from the lower extremity to the tip of the spire, and from which all the spires take their origin; the columella being situated as nearly as possible in the axis of the shell, and serving as its basis and support throughout. It is generally either flat, grooved, folded, or truncated in that part which is visible at the opening. Fig. 11.

_Aperture_, called in familiar language, the mouth of the shell, is the entrance to the chamber in which the animal resides, and is applicable to the openings of univalve and multivalve shells. The aperture is either entirely open, or closed by the operculum attached to the body of the animal, when the animal retires into its dwelling. This aperture varies in form in different shells, being angular, rounded, semilunar, linear, or otherwise, and sometimes appears double, the inner margin being surrounded by an exterior one. Fig. 12.

_Lip_, the expansion of the exterior part of the aperture constitutes the lip in the labiated shells, and the wing in the alated kinds. Fig. 13.

_Beak_, or rollillum, is that part at the base which extends in a straight or slightly oblique direction from the bottom of the aperture, and is larger or smaller in different families. In murex haustellum this projection is very conspicuous. Fig. 14.

_Canal_, or gutter, an elongation of the aperture of the shell descending in a groove or gutter-like process. Some kinds of rolled shells have the canal remarkably conspicuous, forming a fissure from the aperture throughout the whole length of the beak. Fig. 15.

_Umbilicus_, the opening, or perforation in the lower part of the body, or first whorl of many spiral univalves, and is very conspicuous in a number of the trochus and nerita genus in particular. This umbilical perforation runs in a straight line from the base to the summit of the shell, forming throughout a spiral groove or gutter, which is wide at the entrance, and tapers gradually towards the apex. In the Linnaean nerita canarea, the structure of the umbilicus is well displayed, but is still more obvious in the stellariae shell, trochus perspectivus. This opening occurs in many shells at the base of the pillar. Fig. 17.
The umbilicus is either smooth, carinated, crenulated, or bafed with tubercles, and sometimes denticulated. It is either entirely, or only partially discolored, being sometimes half closed up by a gibbosity, or other projection at the aperture, in which case it is termed by conchologists semi-umbilicated, or sub-umbilicated. Sometimes the pillar spreads so far over as nearly to close up the entrance.

A shell without an umbilicus is termed imperforate; sometimes the term imperforate implies that it has neither umbilicus, nor canulation at the base.

Operculum is a teffaceous or cartilaginous appendage peculiar in a considerable degree to the univalve tribe of shells, and those only of the spiral or turbinated kinds. This appendage is not connected with the shell, but the animal, and serves like a lid or little door, to protect or close up the aperture of the chamber when the creature retires within its habitation. Shells of this kind are distinguished by the name of trochus operculate, by some of the elder conchologists. The operculum are often small in comparison to the size of the shell to which they belong; their form various in different species; and their substance in some of a horny texture, and, in others, teffaceous or approaching the nature of flint. Their figure in common is either perfectly round, elliptical, oval, or elongated, and sometimes wrought with spiral work, or concentric lines.

The operculum is commonly adherent either to the upper part of the posterior end of the foot, or, as denominated by some writers, the peda/d of the animal, or at its extremity, so that when the animal moves along, the operculum appears at a distance from the shell. In the nautilus, some of the turbines, and certain other kinds, which have the aperture of a round, semicircular, or oval form, the operculum is usually of a size adapted to the extreme circumference of the opening, or nearly so, and fits close at the entrance; or is very little drawn into the opening when the animal retreats into its chamber. On the contrary, in the volutes and some other shells which have the mouth of a lengthened or linear form, the aperture is comparatively very small, and the operculum might be drawn far into the shell, when the animal retreats into its spiral recess before the channel becomes sufficiently contracted to be completely closed up by this appendage.

The teffaceous opercula easily dissolve in acids; it therefore happens that when put into vinegar they move briskly to and fro for some time, by the ebullition, hence they have obtained the name of creeping flint among the common people. The cartilaginous opercula are not affected by this process. The blatta byzantia, of medical writers, are of this latter kind; being the true operculum of two or three different kinds of shells, very abundant in Palestine, and other parts of the eastern world.

Some of the spiral, or turbinated land shells, are likewise of the operculated kinds, but differ from the foregoing, as they form a new lid, or operculum, every year, or oftener, especially at the approach of winter, when the animal is prompted to make this provision, in order to guard itself from the inclemencies of the weather. It is formed by a vivacious moisture emitted from the body of the animal, and which coagulizes into a kind of tough coagulated substance of pretty considerable thickness; this covering is never attached to the body of the animal; it merely covers the entrance, nor is it ever wrought like the true opercula of marine shells with spiral or concentric lines.

Operculated shells are chiefly the turbinated kinds of univalves; the opercula of the balani among the multivalve shells consist of four pieces, and partake rather of the nature of valves, both in substance and appearance, than of the opercula above described.

Involuted spire, revolved shells (univalvia turbinata clavi- cei intus recumbent, &c. De Coët). These shells turn or revolve inside, or have the whorls concealed within the body of the shell as the nautilus and cypraea. An involuted spire is shown at fig. 18.

Chambers are the spaces or divisions formed in the interior part of shells by intervening partitions, a kind of articulated structure elucidated completely in the nautilus.—By a chambered shell we sometimes understand only that it has some laminiform, sub-spiral, or other process within, as in patella Chincuis. Fig. 19.

Siphunculus, the small canal which penetrates in a spiral direction through the chambers of the nautilus. An organ of this nature is observable also in the ammonite. Fig. 20.

Epidermis is a kind of skin or coating, with which the exterior surfaces of many shells, both of the univalve and bivalve tribe, are covered. It is considered as a sort of peridium or membrane, derived by nature to defend the shell from accidents and aid their growth, and to prevent other teffaceous or marine animals from fixing their habitations on these shells, as they do upon mollusk bodies in the sea, where there is no power of resistance. The epidermis is a genuine covering formed by the animal itself, peculiar to some kinds, and as constantly never observed on others. There is no doubt but the animal to which this fort of covering is peculiar, possesses a proper apparatus for its construction. The nature of this epidermis, it should be added, is very distinct in different shells, consisting in some of a very thin pellucid film, and in others laminated, pilous, velvety, fibrous, or rugged. Few shells, having a rugose surface, are delirious of this external covering or epidermis.

The spines, protuberances, longitudinal ridges, carina- tions, furrows, ridges, punctations, granulations, and other peculiarities of what is termed the “outside work” of the shells, are to be regarded only as specific distinctions of shells; and the variegations of colours, spots, and other similar particulars, are to be considered in the same point of view. These peculiarities are not observable in many shells in their natural state, being concealed beneath the thick epidermis which invests them; in others which have the epidermis thin and membraneous, they are perceptible, but the beauty of the shell is dissolved only upon removing this exterior covering. See fig. 21.

Bivalves.

Or shells of two valves united by means of a cartilage, hinge, connection of the teeth, or other process. In order to constitute a bivalve shell, it is only requisite that it be furnished with two connected valves, without regard to their resemblance in form or dimensions. Some of the bivalves have both valves formed alike; in others they differ only in a slight degree, and again in others they are altogether dissimilar. The first of these is well exemplified by the folio genus; in that of the Linnean taline, we find examples both of the equivale valve shells, and those with the valves slightly different: of the latter-mentioned kinds we have many, as the oyster, spondylus, and anomia. Bivalve shells are often much compressed, some are gibbous, and when viewed at the side, or facing the ligament, have a cordat appearance, as in venus, and the Linnean chamaer. Shells, having both valves alike, as before observed, are called equivale. Equalvalve shells imply those which have both sides of the same valve alike, as for instance, when a longi-

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Multivalves, we shall allude to the opposite margin, the space on each side the line is distinguished by the appellation of the right and left side; and when the form of both those spaces correspond, the shell is equilateral, as in the scallops (Oreot, Linn.): the inequilateral valves are the reverse of this, a line drawn as above described, from the beak to the opposite margin, presenting two sides of a very different shape, as we see in most of the mastra, the donax, and tellina genera, and in the maa truncata especially. Sub-equilateral shells, or those having the valves nearly equal at both sides, are sufficiently elucidated by shells of the cardinal, or cockle genus, which are strictly "bivalvis subequilatera."

All bivalve shells do not completely close their shells, though most of those before mentioned do so, such as the scallop, the donax, tellina, and cardinalium: in several other tribes of bivalves, when the shells are shut as closely as their form will allow, they still exhibit a kind of hiatus or gaping, either at the anterior or posterior end, or at both; and in some, when the valves are shut, both the anterior and posterior parts are closed, but an opening appears on one side of the beak; this last-mentioned character is very obvious in some gigs.

One of the first circumstances to be considered, is which part of a bivalve shell ought to be deemed the beak, because when this is determined, every other part will fall progressively in their relative order under our observation. We name that part of the margin or limb which is situated in a direct line opposite the beak, the base of the shell. Linnaeus, in order to establish the characters, and afford some apparent reason at least for the application of the terms he beffows on the different parts of bivalves, reveres this position of the shell, and describes the beak as the base of the shell. But the fact is, the natural position of the shell is in immediate contradiction to his axiom, for the beaks are always uppermost, being either immediately vertical, or with a slight inclination obliquely, when the animal moves along with its tectaceous covering on the back. A solitary example will perhaps occur occasionally, in which the beaks may be considerably inclined when the animal crawls, but none, we believe, are known which open the valves upwards, and proceed with the beaks under the body. The beaks, if only for this reason, are to be considered as the summit, and the margin opposite as the base. Many of the bivalves are delitute of the locomotive power, or at least do not possess it in any material degree.

Beak of bivalve shells, exemplified in venus verrucosa. Fig. 22.

Summit, a word applied in a general manner to the top or most elevated part of the two protuberances observable in the greater number of bivalves. Da Costa calls that part of the shell, in which the teeth or hinge is placed; the summit or apex; we regard it as the most elevated part of the beaks. Fig. 23.

Beak, the pointed termination, apex, or tip of the protuberances last-mentioned, and which, in many shells, turn spirally downwards, or obliquely, so that the beak itself is seldom the most elevated part of the shell; though it is so sometimes, as for instance in the mytilus edulis, or common mussel. Fig. 24.

Sides, the lateral parts of the valves distinguished by the epithet of right and left side; in common language, the two valves of a shell are called the sides, but it is not understood as a term in conchology in this view. Fig. 25.

Margin, or limb, the whole circumference or outline of the shell, when laid flat down on one valve. Fig. 25.

Dif, the convex centre of each valve, or exterior surface. Fig. 27.

Anterior slope, that part of the shell in which the ligament is situated; in the front view of the anterior slope, the beaks fall back, or behind. Fig. 28.

Posterior slope, that immediately opposed to the former, and in which the beaks of the shell turn forward. Fig. 29.

Lunate, the lunulate depression below the beaks, either on the anterior or posterior slope, and sometimes on both; they may be distinguished under the appellation of anterior or posterior lunate, according to the slope in which they are situated. Fig. 30. a, b.

Cartilage of the hinge, called also the ligament of the hinge, the substance of a flexible, fibrous, and somewhat horny nature, by means of which, the two valves are united near the beak. Fig. 31.

Ears, the lateral processes near the beaks, as in the scallop tribe: those occur either on one side, or on both. Fig. 32.

Ligament perforation, the opening, or aperture, through which the ligature of the animal passes in the animal genus, by the assistance of which it fastens itself to the rocks, or other bodies; in some, it is situated in the flat valve, in others at the beak of the gibbon valve. Fig. 33.

Length and breadth of the shell. The length is measured from the cartilage or beak to the margin below, the breadth is of course taken in the opposite direction. The breadth of many bivalve shells exceeds their length; some remarkable instances of which occur in the folen tribe. Fig. 34.

Inside of the valves exhibits the concave surface (convexitas concharium), fig. 35.

Hinge, the point of union between the two valves, formed by the connection or articulation of the teeth in both valves, or by the teeth in one valve, fitting into hollows or sockets in the valve opposite. The amazing variety of structure observable in the hinge of different tribes of shells renders this one of the most essential characters in the general definitions of shells. The teeth in some are small and numerous, others thick, solid, and few in number, or sometimes single, long, spatuliform, lamiform, arcular, &c. the principal of which may be divided into inarticulate hinge, when only furnished with cleft teeth; or having no visible teeth; articulate, when it has teeth, but only a small number; and multiarcurate, when the teeth are numerous. These variations will be further explained under the respective genera.

Cicatrix, the impression on the inside of the valves indicating the point of connection between the muscles of the animal, and its shell. In some kinds, as the common oyster for example, there is only one such muscular impression in each valve, in others there are two, and some have more. The cicatrix is not of the same figure in all shells, being either round, semi-ovate, lunate, or elongated, in different kinds. Fig. 37.

Bysius, the appendage called the beard; by means of which some bivalves fasten themselves to the rocks. Fig. 38.

The imbrications, furrows, spines, tubercles, reticulations, striations, or other peculiarities of the same nature, as well as the variations of colours, observable on the exterior surface of bivalves as before stated in speaking of univalves (and which is indeed equally applicable to the multivalves, and consequently to shells of every description), though they afford us the best specific distinctions possible, do not claim our regard as primary characters, and are therefore passed unnoticed in this place.
CONCHOLoGY.

MUltivalves.

The shells of this order are few, compared with either of the preceding; and the terms proposed for those are applicable for the most part to the multivalves. The following require more mention.

Base, that part of the shell upon which it rests: in the lepisi tribe it implies the part immediately feated upon the stem or pedicle; in the balani, the base is generally larger than the summit, and is the bottom by means of which the shell is fixed upon the rocks, or other extraneous bodies. Fig. 39.

Ligament, the substance, whether membraneous or tendinous, which serves to connect the valves together. The connexion of the valves in some multivalves is formed by the parts of one valve locking into another. Fig. 40.

Operculum. The balani have the aperture at the summit closed by means of four small pieces or valves, which are commonly called the operculum; these opercula of the balani are, however, very different from those of univalve shells. Fig. 41.

The various parts of which teataceous bodies consist being sufficiently considered and explained, our attention is next directed to the different modes of arrangement into which those bodies have been distributed by the principal writers on conchology, and a general inquiry into a variety of other particulars connected with the history of the science.

In this investigation we shall avail ourselves in some measure of the method pointed out by the learned author of the "Clases Conchyliorum" (Bergen), the valuable "Bibliotheca Hiift. Natur. Bankhia" of Mr. Dryander; "La Conchologice" of Favenne; the "Historical Account of Teflacological writers," by Dr. Maton and Mr. Rackett, inferred in the "Transactiions of the Linnean Society;" and the labours of many others, in addition to our own, as will appear in the course of the following observations.

The name of Aristotle stands high in the records of philosophy. He is emphatically called by Dr. Pulney, in speaking of teataceous writers, the father of natural science; and by Dr. Maton the inventor of system. Our respect for the Macedonian philosopher is great, nor would we willingly appear to detract from his distinguished merit; yet we must confess we never could conceive it possible, with all the ability this early writer possessed, that, rising as it were from primal darkness, he could at once survey the multiform objects of creation, and produce a system of natural objects to complete as that which we are disposed to acknowledge exclusively as his own. He must have derived considerable aid from sources then extinct, and which are now for ever lost to the world. The history of mankind throughout all ages will testify beyond a doubt that the acquirement of human knowledge is slow and progressive; and the knowledge of Aristotle in natural science was in particular of that kind which in a great measure could be attained only from the observations of many. Under the patronage of Philip, the Macedonian monarch, and of his son Alexander, the hero of the world, no advantages which Aristotle could derive from the study of books would be denied him, and can it be imagined from so many hundred thousand volumes as were extant in his time, and at his immediate command, Aristotle was unable to obtain information; or that among this immense number there were none on the subject of Aristotle's inquiries? This writer would certainly avail himself of the recorded labours and discoveries of former ages, and especially would not neglect to cultivate an acquaintance with the sciences of the Egyptians, upon all which his own ideas might improve. Indeed, if we mistake not, however unwillingly it may appear, the latter was the genuine source from whence his knowledge of natural philosophy was derived. Egypt, not Attica, was the cradle of science.

To the writings of Aristotle the learned world is certainly indebted for the first account we probably ever had of the state of natural science at the early period in which he lived; it is a fortunate circumstance for the cause of learning that his labours have survived the havoc of destructive time. This system is a production that would confer credit on any naturalist of the fourteenth century, much less of a period almost two thousand years before. The classification, or division of shells contained in the fourth book of "Aristotle's History of Animals," has fixed the tells of ages, and, with improvements, rendered necessary by recent discoveries, is in general adopted by very late writers. Linnaeus was in a great measure himself indebted to this system for the outlines of his own, for many of his genera, and for the names under which those genera are retained, even in the most improved state of his "System of Teflacology."

The "Olivaceoderma" of Aristotle, for such is the title of his conchological productions, present us with a valuable scheme of shells. He divides all shells into two principal classes, Monolopa and Diolopa, or univalves and bivalves.

The univalves he separates into two parts; namely, those of the turbinate kind, as Koegion, or limacs, Kacillus, coca lia, the purpore, Nougia, buccinia, Kdaxa, &c., and those as are leftes turbinated, as Arx, the sea-ears, or hailiotis, and Niofia, meriae. Among the latter, he includes several families of the echinus, or sea-eggs, Ezgius, a tribe of crustaceous animals retained by almost every writer among the shells, till they were separated by Linnaeus. He also speaks of the animals inhabiting the cocaia, purpurea, and buccina.

The bivalves he distributes into several families; he has Koia, or peletines, Evon, foliates, and Hina, pinea or feathered, all of which genera have been retained by Linnaeus, and later authors.

Aristotle commits one remarkable error, however, in placing the operculum of some turbinate univalves as a genuine tribe of shells. This error, which indeed we think excusable considering the age in which that philosopher lived, is mentioned by several authors as an objection to his accuracy of discrimination, and is commented on by Bergen in the following observation.

"Ex umbilicis fl; r 20z; videtur Aristoloteles peculiare conchyliorum genus perperum confluatissimum, sunt enim propri opercula quorumdam turbinateorum, quem certe anni tempore foribus coelitacorum quasi illar clarifit, agglutinae inventorem quaeque polles didactet & nullius amplius utus pro ipso animale.\"

Aristotle flourished 322 years before Christ.

C. S. Pliny wrote largely upon conchology; the ninth book of his "History of Animals" is very copious: it is more diffuse than that of Aristotle, and the arrangement is unmethodical, but this is still an useful work, and may be consulted with advantage. Many of the terms employed by modern conchologists are to be found in his work. Pliny classifies thirty-three families, which are distinguished chiefly by the form and superficies of the shell, as plana, corna, longa, and luna, falcis, and rugata; by the shape of the margin, as margin in meucenem cinia; margin foris effuso; and margin intus replicato. The finiitos, or projections of the shell, the connexion of the valves, and other similar characters, were also taken as distinctions of the different families.

In Pliny's time the Romans are supposed to have possessed considerable opportunities of acquiring a knowledge of shells, as their navigation was extensive, at least in the Mediterranean and the Red Sea.
The conchological writing of \( \text{this} \) is held in high esteem either of the preceding; he dedicates some concise chapters to this subject in his work entitled, "Histoire des Coquillages." After the dark ages which succeeded, Vincentius Bellocavendus was one of the earliest writers on this subject. His "Speculum naturale," published in folio, in the year 1494, contains a description of the oysters, purpurae, olrea, and a few other remarkable shells, extracted chiefly from the works of Aristotle and Pliny, and intermingled with the absurd and superstitious notions of the times. The works of Albertus Magnus, entitled "De Animalibus," which appeared in folio in 1495, contains descriptions of some shells; and to likewise does that of Adam Lonicerus, "Historia naturalis opus novum," published in 1571.

The first writers who distinguished themselves by any attention to the study of conchology, after the revival of letters in Europe, were Belon, Rondeletius, and Gesner. Belon is celebrated for his travels in the East, and he was perhaps one of the first learned men who travelled principally with a view to natural science; on his return to Paris, in 1553, he published, besides other works, an octavo volume, entitled "De Aquatilibus." The part appropriated to conchology is not extensive, it is rather elementary and philosophical than descriptive; but contains figures of a few shells engraven on wood. The work of Rondeletius (professor of physic at Montpelier) appeared two years after, A.D. 1555; it bears the title of "Univ. Aquarium Historia," and contains upwards of one hundred species of telescence animals. His residence on the coast of the Mediterranean afforded him abundant opportunity of investigating the shells of that sea, and their animal inhabitants, a subject of inquiry to which he paid some attention. This author received much assistance from the labours of Aristotle and Pliny. The "Commentaries" of Matthus, embellished with a few cuts of shells, contain nothing of material interest, except what has been collected from former writers; several editions of this work appeared between the years 1566 and 1583, in Spain, Italy, France, and the Venetian states. In 1558, the work of Conrad Gesner, "De Piscium et Aquarium Animaantium Historia," made its appearance, and acquired much reputation. Dr. Pulney pays a high compliment to Gesner for his unparalleled industry, and ardent love of natural history, and observes, that he not only collected all the philological, historical, and descriptive evidences of the ancients on this subject; but besides his own obvious comment on their writings, availed himself of what Belon and Rondeletius, his contemporaries, had done, to which he added much original matter of his own, having described and figured many of the Mediterranean shells and several of those discovered in the Indian and Arabian seas. This comment is correct, but of the system proposed by Gesner for the classification of shells, we must speak more fully. This author divides all shells into four classes: univalves, bivalves, turbinata, and anomalies. The first contains only two genera, lepas and auris marina; or the barnacles, and sea ears (kupa derived from the Greeks, and synonymous with patella, being the name applied by old conchologists to the limpets, since called patella by Linnaeus). His bivalvia claus, contains many genera, as ostrea, quadrula, solen, tellina, clamos, pinnæ, folines, and eight others. In the third claus turbinata he has ten genera, as the mili, murex, hippocucum, turbo, turbinus, etc., all which names will be recognized by the Linnaean student as those employed by Linnaeus. His fourth claus anomalies, is exceptional, as it contains, besides the balani, pectus marina, tubata marina, and echinidi, the stellæ marina or starfish, and caput medusa, neither of which have ever been considered by other naturalists as appertaining to conchology. Bergen admits this as a material objection to his system, "peculiarem claus anomalyorum confidit, ad quam, ut mili videtur, adnumerandae. Ideem valet de capite medusa." His separation of the balani from the two first classes is contested by all late writers.

Geoffrey Linoeair, in his "Histoire des Poissons," published at Paris in the year 1529, gives an account only of a small number of shells; the work not being devoted to the subject of conchology: neither is that of Imperator, published at Naples in 1559; though it contains an account of some species, this profession relating chiefly to fishes, it bears the title of "Del. Historia di Ferrante Imperato Napolitano."

The work "De Molibus Cruftaciac, Tellaciac, et Zophytil," of Aldovichus, appeared in folio, in 1567, and is well known. His arrangement consists of three classes, turbinata, bivalvia, and univalva. Among the turbinata he includes the nautilus, and also the bivium, and other spiral shells, together with the echinid. The bivalve is the same as that of all other writers, as ofrea, tellina, and pinna, but besides these includes the multivalve shells of late authors, such as the balani and pholades. The third class, or univalvia, contains the lepades, peltalæ, auris marina, concha venerea, concha perica, and pectieus marinus. The figures consist of cuts on wood, and are rudely executed.

Tabulius Columna, in 1615, published a treatise on shells, or rather a monograph on the purpura, entitled "De Purpura ab animali tellaceo fusia, de hoc ipsis animali, altiquo rariobus tellaribus quibusdam." A new edition of this work, with annotations, appeared in 1675, by John Daniel Major.

In the year 1616, a work entitled "Faciesius rariores et aspecies dignorum vari generis, qua collect et eisimpennis uni ad vivum incidi curavit," from the pen of Baffi Beller, apothecary at Nuremberg, made its appearance; it is in Latin and German, and two of the plates are appropriated to the subject of shells.

Chioceco, the describer of the "Museum Calceolarii," published at Verona, in 1622, gives a full account of the shells contained in that collection, with specific characters in the Latin language, borrowed for the most part from other authors. This museum was begun by Benedict Cereto, a physician, and afterwards enlarged by Calcolari. The figures of the shells occupy fix plates. It appears to be the first work that was written professedly as a description of a museum of natural curiosities, the account of the same museum by J. P. Olivius, published in 1584, alone excepted.

A physician of Hamburg, Schonveld, was author of an account of aquatic animals, both of the marine and fresh water kinds, found in the duchies of Sleueck and Holstein, which contains separate chapters on oysters and mufcles. The observations relate chiefly to the culinary uses of the animals. This book bears date 1628.

The work of Nierembergii, "Historia Nature," contains an account of a number of shells, but does not pretend to any figures. It was published at Antwerp, in 1635.

In the first edition of the "Gazophylacium Renum Naturalium" of M. P. Beller, the brother of Baffi Beller before-mentioned, are twenty-four plates, containing, among a variety of other subjects, natural and artificial, a few figures of shells, with a concise description in Latin of each, under the respective figures. The second edition comprises
six additional plates and a preface in German. The first was published in 1642, the latter not till the year 1733.

The synoptical catalogue of Seger, "Synopsis Methodica rariorum tum Naturalium tum Artificialium que in Museo D. Olei Wormii afferuntur," was printed at Copenhagen in 1653; and, as the title informs us, describes both the natural and artificial curiosities in the museum of Wormius. This was succeeded in 1753 by a more ample account of the museum by Olaus Wormius, from which it appears to have contained many of the telleaceous tribe, one only of which is however figured; this is the Linnaean lepas antiferæ, to which is added tubulifera, baldini, concha antiferæ, dentata, and entalia. His bivalve genera are less raptly defined; in addition to those established by Junon, he forms others in imitation of Pliny, taken solely from the early apertures, fuses, or smooth exterior surface of the shells, after previously dividing the whole classes of bivalves into two orders "concha alperea, and concha leves."

Nothing appeared from this time of material consequence on the subject, till the republication of the treatise of Fabius Columba, by Dr. Major. In the interval, Steno published a work, entitled, "De solido intra solidum naturaliter contenuto Diffractiatiis Prodromus," which contains some pages devoted to an explanation of the fabric and texture of telleaceous bodies. Boyle described some experiments on the phenomena of shell-fish, particularly of the ovifer, under an exhaust'd receiver, in the Philosophical Transactions of the year 1675; and Wills, in 1672, the anatomy of the ovifer, in his "Exercitationes de Anima Brutorum," but these are only physiological dissections. The work of Dr. Major includes a new system annexed to the history of the purpura previously published by Fabius Columba, and likewise a "Dictionarium Oseologiicum," and it besides dentalia and entalia, illustrated with a number of wood-cuts. All shells are divided by this systematized into two classes, univalvia and plurivalvia, the first of which is subdivided into several orders, the characters of which are taken from the form and structure of the opening of the shell, its turbinations, ventricosity, protuberances, or general figure. The genera constitutio of those shells are few, as penicillii marini, pyramidaliter dentata, lepades vel patellæ, auris marina, concha natatæ, concha venera, nautilii, murices, turbo, turbinias terrefles, and buccia. His class plurivalvia is separated into two orders, bivalva and plurivalvia, the first of which consists of his conchæ frigidiæ, conchæ verrucosæ, conchæ rugosæ, pictæ, olivæ, and conchæ anomæ; the plurivalvia only two genera, conchæ antiferæ and bæalæ, or giadae. The two latter genera are those united by Linnaeus, under the name of lepas, and which, before the time of Major, had been improperly arranged, either among the bivalves, or univalves, except by Gmelin, who, aware of this impropriety, places the bæalan at the head of his class anomala. This production of Major's appeared in 1677.

Legati was author of the "Musco Cofipiano," printed at Bologna in 1677. The basis of this collection was led by the celebrated Aldrovandus, whose hand-writing still remains affixed to many specimens that formed the subjects of Legati's description. Ferdinando Colipi, a Bolognae parstician, afterwards augmented it so considerably, that his name became attached to it; and the university of Bologna, to which it was at length presented, considered it one of their most valuable acquisitions. There are not many figures of shells in the "Musco Cofipiano," but the descriptions of this tribe are numerous, and very ample.

In the twelfth volume of the Philosophical Transactions, is a "Relation concerning Barnacles," by Sir Robert Moray. This credulous observer gives a description illustrated by a rough outline of lepas antiferæ, from which he affirms, that young geese may actually be seen to emerge.

"Ilanderus,
Harderus, in a dissertation entitled, "Examen anatomiae Cochleæ teretribis dominort," affords an anatomical description of helix lucorum. This appeared at Basili in 1679. Two years after Grew published his "Museum Regni Sociatis," or "Catalogue and description of the natural and artificial rarities belonging to the Royal Society, and preserved in Gresham College, London." This was the earliest work of its kind that appeared in the English language.

The shells are described in two chapters, the first comprising univalves, the second bivalves and multivalves, illustrated with about forty figures, to which the current English names are annexed.

The descriptions are not entirely approved by late writers; they are confounded too loose and defective, or too concise and uninstructive. His distribution of shells comprehends univalvis non turbinata, bivalvis, and turbinata. In the former divisions, this author, Dr. Maton obverses, "has strangely separated species naturally allied to each other, as, for instance, the fepulcet,Adultis, &c. are left out of the first clafs; and, as well as the porcellane, distributed under the third; and, with equal want of conftancy, the haliotis and nautilus (genera manifeftly turbinated) are placed among those which he terms "univalvis non turbinata." The fame objeclion is urged by Bergen againl the fystem of Buonanni.

"Hic A. tres condidit conchylorum clasfis; univalvis, non turbinatorum, bivalvis et non turbinatorum, fed partim aliena immiffum, partim neceflia omiff. Sic in prima classi merito difiderantur penicilli marini et porcellane, quas perperam ad turbinatas refert. Sic malo confilto auro marini, et nautilus huic præmio fociavit classi, cum manifeffe ex turbinatro fente fit." Buonanni is blamed also for admitting the pholades and conchæ anatiferæ into his second, or bivalve clasf; but it should be remembered, in this respect, he only imitated the example of most systematic writers; Grew places the pholades among the bivalves; Aldrovandus gives both the pholades and conchæ anatiferæ in that clasf; and J. Milton the former. Linnæus, we are to recollect, like the latter, confiders the pholades as bivalves in all the early editions of the Systema; even fo lately as the tenth edition, they fland under the "bivalve conchæ." We may still further advert to Charleton, who yet more abfurdly arranges the conchæ anatiferæ with the univalves, at the fame time that he refers the pholades to the bivalve tribe. Major was the only writer before the time of Buonanni who dispofed of the conchæ anatiferæ in their natural order, which he certainly did, by arranging it in his clasf plurivalvis. In the work of Buonanni will be found many philosophical observa-

tions upon the origin, nature, formation, properties, and other curious particulars relative to fcelous bodies.

The "Scripta Illustrata" of Sir Robert Sibbald, published at Edinburgh in 1684, offers an outline of another system. The author divides shells into two parts, the land and aquatic kind; or "cochleæ teretribes," and "cochleæ aquatæ." The aquatic shells are divided into two distincts, the first containing the fresh-water shells, the other those peculiar to the marine element. The shells of both kinds are distributed into three families, turbinate, bivalves, and univalves. The subdivisions of those families are rudely defined, but upon the whole there is method in the classification; the genera are selected from the writings of former naturalists, but too often inaccurately. Sibbald places the echinides among the turbinated shells; yet this is even more excusable than his introduction of both the pholades and balani among the univalves.

Marigliani's small work on the ova of teataceous animals, appeared at Bologna, in 1683, under the title of "Relazione del Ritrovamento dell'Oova di Chiocciole;" a new edition of which was published at Rome in 1695. Some additional observations on this subject, by Fulberti, "Reflectioni sopra il medesimo Soggetto," usually accompany this work.

Among the "Obervazioni Naturali" of Paolo Boccone, published at Bologna in 1684, are some remarks not altogether uninteresting on the subject of conchology. He was the first writer who described the pediculus ceti (lepis diadema of late authors) with accuracy.

In the same year Dettede gave an anatomical description of the common mule in the Leipsic Commentaries, and which was afterwards re-published in Valentini's "Amphi-
theatrum Zoodomicum.""An elaborate paper on the purple-fish (buccinum lapillus) by Mr. William Cole, pointing out the mode of obtaining, and the nature of this celebrated dye, or Tyrian purple, was inserted shortly after in the Transactions of the Royal Society. This tract was re-printed in quarto in 1689.

A production of very uncommon merit about this period made its appearance before the public, the great conchological work of Dr. Lillier, entitled "Historia five Synopsis methodica Conchylorum," the publication of which commenced in 1685. The author had previously distinguished himself by some excellent dissertations on the same subject; but our attention is principally directed to this, as his most extensive, if not most valuable, undertaking. It was published in folio progressively from the year 1685 to 1692.

Lillier divides his work into four books. 1. "De turbina-

bus teretribis." 2. "De Turbi. aqua dulcis et Bival-


nisis marinis."

There is no text to this work, the whole consisting of engravings, with a concise description of the shells, and reference to their native country, where that could be ascertained, in the Latin tongue; and sometimes their current names in English. The plates, which are of various dimensions, are executed with great force and strength of colour by the hands of the author's two daughters, Susannah and Ann Lillier. It is an extraordinary circumstance, that no two copies of this work are found alike, which renders it very complex, and ill suited for general reference. The plates in the most perfect copies vary in number from 1050, to 1057; or 1607, the different copies having been augmented or diminished, and the plates transfused or corrected at various times, according to the fancy of the author, or his subsequent discoveries. The most perfect of all the copies extant was that...
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that presented by Dr. Lister himself to the royal library at Paris. This is ascertained by the observations of Davila and M. de Bure, who have taken considerable pains in the collation of different copies of this work. Da Costa names that in the library of the College of Physicians as the most complete copy in London. This last-mentioned writer appears also to have collated many of the early copies of Lister; he treats on this subject at some length; and, considering the importance of Lister's work to the conchological student, it may not be improper to repeat the result of his observations.

"I do not think it unentertaining (says this writer) to relate some circumstances relative to this useful and costly work, which have occurred to me, on the collation of many copies of the old editions of Lister, and on a collation of numbers of his proof prints differed among the curious by Dr. Lister himself before the names and numbers on the plates were added to complete the work; these proof prints, which are what the print collectors style variations, will lead us to some curious particulars that would otherwise be unknown. Dr. Lister in 1678 published his "Hift. Anim. Angl.," in which he treats of English shells, and gives excellent figures of them, and good descriptions; he therefore designed this work, (his "Hift. Conchol.,") only for exotic or foreign shells, as evidently appears from the proof head plates of the first book. N. 8, 25, 33, 40, 43, 63, 74, 83, 99, 108, 125, and 136, which are entitled cockle, buccina, &c. exotic; but the word etoxia was erased when he changed his mind to have a general history of shells, which probably was at the second book, and the crafemen of the work exotica is even now plainly seen in all the quoted plates. Dr. Lister, to complete his intended work, carried home all the shells singly to his daughters to engrave on single or detached copper plates, (as is seen by the work) reserving their arrangement till he had a sufficient number, some not being done to his approbation, or getting better specimens afterwards, he had them re-engraved, and therefore many shells appear twice in his work, and in some only the first engraving, while in others on the second engraving is found; this circumstance is also evident from the proof plates, or variations." Da Costa further states it to be a mistaken supposition that there was only one edition of this work; there were, he says, certainly two, and he concludes with these observations in support of his assertion. "However, there are marks by which these editions may be distinguished by an accurate critic, viz. 1. The second edition has seventy-five shells more than the first. 2. In the preface, plate IV. the third paragraph begins "Septuginta autem, &c." 3. In plate VII., which specifies the places where they are found, the first edition has only one column of names, whereas the second edition has a name, viz. Fret Magel, in a second column. 4. The title and all the head plates, as 1, 2, 3, 100, 106, 139, 140, &c. are printed partly in black and partly in red letters; whereas in the second edition only the title, plate I., is printed in red and black letters, all the others being printed only in black letters.

The plates of this work were bequeathed to the university of Oxford, and were republished in 1770, under the direction of the Rev. Wm. Huddsford, keeper of the Ashmolean museum, who subjoined two indices, one according to Lister's distribution of the shells, the other after that of Linnaeus. This edition differs from the former principally in containing several plates on one page, the whole amount is 108, comprehending altogether 1153 shells, exclusive of the fossils and anatomical subjects; even of the plates, however, which appeared in the original work are omitted in this edition.

After this period, and previous to the work of Rumphius, the first edition of which appeared in 1705, the names of Fehr, Normann, Schelehammer, and others, are recorded as contributors to the elucidation of conchology, yet their productions are to be regarded only as subordinately to more extensive and important investigations. Fehr wrote a dissertation on the argonauta argo, which was printed in "Eph. Acad. Nat. Cur." A. D. 1686. Normann, in the same year, gave an anatomical dissertation on the purpura, which was published at Upsal. The observations of Schelhammer, published in "Eph. Acad. Nat. Cur.," relate to the subject of fresh water shells. Brachius also treats of the ova of some species of ophria. "Le Cabinet de la Bibliothèque de Saint Genevieve," of Du Molinet contains a few figures of shells. In the Philosophical Transactions, vol. xviii., is a communication on the subject of shells, addressed to Dr. Lister, by Mr. Banister who refuted many years in Virginia, and in the same volume is a description of certain shells found in the East Indies by Witten, but these are confessedly too imperfect to merit further mention. Sir Robert Sibbald also published some curious papers on teleology about this time, but his system, and field production, on this subject, have been already noticed. Erius, in a dissertation entitled "Concha antefxia viridicata," refutes the absurd tale of the Bernaee geese hatching in those shells as related by Sir Robert Moray. Leewenhoek published several treatises on the anatomy and intestinal structure of shells. Leigh notices a few of the British shells in his "Natural History of Lancashire," and Wallace an inconsiderable number in his "Account of the Islands of Orkney." The works of Petiver, which are dispersed in the 22d, 23d, and 24th volumes of the Philosophical Transactions, and his "Gasophylacium Naturæ et Artis," may be consulted with advantage, being referred to by Linnaeus and other late conchologists. This brings us to the time of Rumphius.

The popular work ushered into the world under the immediate patronage of the liberal collector last mentioned, claims particular notice. This valuable acquisition, for so it must be considered, bears the title of "Amboinse Rarite it Kamer," the "Rarity Chamber of Amboyna," and contains an account of the more remarkable natural curiosities in his museum, the productions of Amboyna, where they had been collected chiefly by Rumphius himself. The descriptive matter is from the pen of M. Schein Voet, and the plates are engraved in a bold style from the designs of Madame Merian. Of sixty plates with which this work is embellished, no less than thirty-three are devoted to the subject of shells, the total number of which amounts to about four hundred subjects; and many of these were of great rarity and price in those days. The passion for collecting and furnishing cabinets and museums began at this period to be very prevalent in Holland, from whence it afterwards extended over the other parts of Europe. The collection of Rumphius was an object worthy of emulation; and many wealthy individuals endeavored to excel in this pursuit. The forming a collection of rarities at that period was considered a serious undertaking. Articles of rarity of this description will always obtain a considerable price. It is related as a matter of astonishment that Rumphius himself informs us a shell described in his work cost no less than five hundred florins. The sum is great, yet there are few cabinets of any note that do not include articles of equal or much superior value.

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1714, of

The papers Resumur, in fcript in the memoirs of the
the French academy, between the years 1709 and 1717, de-
serve the attention of the conchofift; they relate, for the
moll part, to the formation, growth, and motive powers of
tellaceous animals. The natural iftory of the place, and
the formation of pearls, are amply treated of in a memoir
which appeared in the volume for 1717.

In 1720 Fridericus Rnyich published a description of his
museum at Amsterdam, entitled "Dictaurus Animahum
primum" it relates only in a partial degree to fells,
the figures of which are grouped with coral and other sub-
fances as they flood in his museum.

Morton, the natural Librarian of Northamptonshire, de-
cribes many fells, for the figures of which he refers to
Lieder. This work was published in folo in 1712.

Among the plates illuftrative of various curious fubjects,
contained in the manufcript of Gottward of Dampvrie, dated
1714, forty three are appropriated to fells. Few of the
original copies are complete; that poftifed by Sr Joseph
Banks is perfect.

Three pafes of fells are to be found in the botanical
work of Barreließ, edited by the elder Joufien, which
appeared in 1714, and the ifame number in the "Rariora
Mufci Belliiiani" of J. H. Lockey, published two years after.
The "Amphitheatrum Zoontomium" of M. B. Valentinii, brought forward at Frankfurt in 1720, includes
many extracts from for-forning authors, and fome plates rela-
tive to fells, but which are not confidered to poffefs any
merit of originality, or execution; Bradley, in his philo-
phy fical account of the works of nature, touches on the
fubject of tellaceology though in a fuperficial manner.

The valuable work of Car. Nic. Langius, "Methodus
nova Tellacea Marina in faus Claffes, Genera, et Species
distribui66," was published in quarto at Luccene, in 1722.

To the writings of this able naturalist, Linnaeus fland is highly
indebted. He is an author (lais Dr. Maton) not undue-
erving the title of a feientific one, and whose fystem, fo far
as marine tellaceae are concerned, and of these alone he
wrote, certainly plates at the great clue to simplicity,
which was afterwards fo successfully and admirably fized
by the great reformer of natural history in general": "He
is the fift whole generic characters are founded on com-
monifh dilftinctions: the aperture of univalves, and the hingie
of bivalves, being particularly confidered. These dilftinc-
tions are not allowed their due importance throughout, for
the contour of the fhell is, in many infances, made the
exclusive basis of the definition, and the adoption of this
naturally led, as in other fystems, to a moll inconvenient
and perplexed multiplication of genera. The parts, claffes,
and ficfions, also are far from being well conceived, and con-

5

C O N C H O L O G Y.

borals rather than affift the investigation of the other divi-
sions." After perufing fhefe general flatures the curious
reader may be defirous of acquiring fome knowledge of
this author's fystem. We are inclined to think it entitled
to rather higher prafie.

Langius divides fells into three parts. 1. Tellacea marina
univalvia, non turbinata. 2. Cochleae marina. 3. 
Concha marina.

His firt part is subdivided into two claffes. Clafi 1. Tel-
acea marina univalvia non turbinata, et in fe non fonortia.
Clafi 2. Tellacea marina univalvia, non turbinata in fe con-
torta, in qua ut corum fpira non prominente. His cochleae
marina, or part. 2. confifts of six claffes, vni. 1. Cochleae
marina longae. 2. Cochlee canaliculata. 3. Cochlee marina
ore et tuncure mmcnon elongatis, prima fpira notabiliter
ventricos. Buccina. 4. Cochlee marina ore et mcmone
elongatis, prima fpira notabiliter anguiifior quam in
Buccinis. Stromba. 5. Cochlee marina ore adinodium
breui mcmonc elongatis. Turbinia. Trochi. 6. Cochlee
variae bireore ore et mcmonce contrahitos. The fides
are divided into ficfions, the diftinguifliing characters of which are
taken from the moft prominent features of the various
tribes of fells, as the forma of the fhell itself, the ftruc-
ture of the aperture, the calcification, or lip, &c. in
univalves, and the shape of the valves, their diflimilir-
ty, the beaks, hinge, teeth, &c. in bivalves. The ficfions are divided into many genera, the firl claffes con-
taining seventeen, the fefcd fifty, and the third forty-
three. Many of the genera of old writers are divided, and
sometimes not injudiciously, into two or more genera, to
which new names are affigned, that Linnaeus and later
writers have adopted. We cannot further digrefs on the
merits of this work, but as a fystem recommend it to the
attention of the curious conchofift.

In the work, entitled "Oud en Nieuw Oost-Indien," hy
Valentyn, are sixteen plates of East Indian, or Amb-
boyna fells. This bears date Amsterdam 1724 and 1726,
being published in folio parts. These plates were
afterwards fold separately with defcriptions; the new ed-
iton of the plates appeared in 1754.

"Borne's History of Jamaica" is a valuable work, and
relates to conchofogy, among a miscellaneous variety of
other departments of natural iftory. He was the first per-
fon who vifited the West Irida iflands for the fole purpo-
s of investigating their natural productions, and his plates
and defcriptions relate of course to many fubjects not before
known. His discoveries were submitted to the public in
1725.

In the following year, John Christ. Kundmann published
his "Promptuarium rerum naturalum et artificium," &c.
in quarto. He proposes three principal claffes for the ar-
angement of fells. Claff 1. Tellacea univalvia non tur-
binata. Clafi 2. Tellacea bivalvia. Claffe 3. Tellacea
univalvia turbinata; each of which is divided into a number of
genera, somewhat after the method of Binonanni.

A new arrangement of fells, by John Ernest Hebenfreih,
appeared at Leipzig in 1728; "Differtatio de Ordinibus
Concholarum methodica Ratione iniultmacis." The limits of our observations will not permit us to enter minutely into
this methodus tellaceorum. The fystem of this author comprehends fveral principal claffes: namely. Claffe 1.
Univalvia irregularia. Claffe 2. Univalvia regularia, quae
spira carens. Claffe 3. Univalvia regularia, quae fpira
gaudent magis turbinata, turbin per totum excurrente. Claffe 4.

De
De veritis tantum turbina, one per totum hians, turbinitus oblique axis. Ch. 5. Univarsa, veritis tantum turbinata, one per totum hians, spiris circa centrum axis. Ch. 6. Minus turbinita epira unica brevis. Ch. 7. Bivalvia valvis per ginglymum connexis. Ch. 8. Bivalvia per ginglymum coherentia. The outline of his arrangement may be collected from his definition of the classes. His families, or subdivisions, and genera are numerous, and are characterized by the figure of the shell, the aperture, hinge, and other remarkable particulars. Dr. Montgomerie's writer of having introduced an useful, if not philosophically distinct, between tests and conchylia, and this exceedingly well. The same object he had in view. "Cl. or often distributed inter testes et conchylia, et notionem generalem tribus prioritibus, quia et malacoltri, et othoorders, conchylia vero solo othooorders sub teste comprehendunt, sed non magni momenti nihil vestrum hoc distinctum. Hic viscaliens considet et perpendo sub notione testes et durum et mollem tellam intelligenti poiste."

The "Dissertatio Physica de Polythalamis, nova testaceorum claffe," by Breyneus, comprehends an arrangement of recent and fossil shells, but the chief merit of the work is allowed to consist in the more exact definition this writer affords of the bivalves, ammonites, and othoorders, than had before appeared. Of the orthoorders tribe, he describes eight distinct species, the two others are treated his copiously. His classification of recent shells is far from peripatetic. This was published in quarto in 1732.

About this period, the attention of many ingenious writers was directed to the investigation of the teredo, or shipworm, then, as it was believed, very recently imported from warm climes into Europe; it was first observed in Holland. The first account was given by the persons appointed to take care of the dykes, who perceived, that the piles which were of the hasted oak, and had been placed to defend the low countries from the incursions of the sea, were eaten through in a few months. The damage occasioned was immense, and the people of Holland thrown into the utmost consternation, till remedies were discovered to prevent the evil. Among the writers on the subject, are Tylfius, Roulet, Potme, Bulmer, Mallet, and Sellius, the last of whom particularly distinguished himself by his work entitled, "Historia Naturalis Teredinis seu Xylaphagi Muniti."

Du Hamel, in a paper inserted in the "Memoirs of the French Academy," in 1736, treated on the purpurs of the ancients. The work of Swammerdam, "Biblis Naturalis," appeared in 1737, and will be found to contain much curious matter, and anatomical research into the nature of testaceous animals. In 1739, the work of James Pallas, "De Conchis Arimincibus minus notis," appeared in Venice. This relates principally to the minute shells found at Rimini in the Adriatic sea. Some of the microscopic shells described by this author, very much resemble the corus ammonis. A second edition was published in 1743, and another at Rome in 1745.

Guettardi's work on shells is a standard book of reference, and as such is well known. This is entitled "Index Testarum Conchylorum qua deivantur in Museo Nicolai," &c. It was published in Latin at Florence, in 1737, and contains 110 plates of shells; the figures of the univalves in which are regularly placed on their summit; they are not withholding tolerably correct; the descriptive matter is less interesting. This author exhibits a system of shells composed by Tournemire, the celebrated botanist, long before this time, from manuscripts on the subject that had been preferred to him by professor Targioni. This arrangement is valuable, and highly worthy the perusal of the inquisitive conchologist. The Linnaean fluentes, in particular, will perceive that to Trunfort, as to Linnaeus, he is indebted for some of the latest amendments of the Linnaean system, and for many of the subdivisions and terms in present use.

"De Conchylologic" of D'Argenville is a voluminous work, and contains a vast number of excellent descriptions, and many figures. The first edition of this work appeared anonymously, under the title of "L'Histoire Naturelle éclairée dans deux de les parties principales, la Lithologie, et la Conchylologie," &c. in 1742; and a second edition, considerably augmented, in 1754. The last edition was published in the year 1780, with many additions, corrections, improvements, and a series of plates containing about 2500 figures, by M. Favanne de Montcvelre and his son.

The name of Bartram occurs to a paper in the Philosophical Transactions, vol. xiii. A.D. 1744, entitled "Observations concerning the Salt-marsh Mucelle, the Oyster-bank, and Fresh-water Mucelle of Pen-sylvania," illustrated with figures. A copious account was also given about this time by Needham, of the lepis anatitae. The "Tentacce-Theologia" of Leffif, is embellished with 137 figures of shells, and abounds with physiological and anatomical observations on the structure of these testaceous animals.

Some mention is made of shells in Dr. Charles Smith's "History of the Counties of Waterford, Cork, and Kerry," A.D. 1745-1756. Two papers, one relating to muddy lithophages, and the other to pholus polyphila, are inserted in vol. iv. and vol. lv. of the Philosophical Transactions. In Sir John Hill's "History of Animals," are an arrangement of shells, and some figures; it appeared in folio in 1732.

The first work of Klein's that claims mention in this place is his "Descripciones Tubularum Mammorum," containing nine plates, which chiefly represent different species of bivalents; with various kinds of recent shells, as, polenes, dactylus, &c., and are introduced in order to complete his arrangement of the tubular coverings of animals. But the principal production of this writer is his "Tentamen Methodol Odracologice, Fide Dipsotita Naturalis Cylindrum & Conchorum," in fours claves, genera, & species, &c., printed at Leyden in 1753. It has been objected against this work that the general divisions forming parts, sectors, classes, and genera, are too numerous; and what is worse, that species are constituted, in some instances, without being referable to any genus, and that, in one of the parts, there is a hystory genus without any clas. (Dr. Motior)—"Claves, genera, & species minimum, ut mihi videtur, multiplicitas; quae sepe fort variations specierum, species vocavit; quae sunt specierum, generum nomine indigent; & ex generibus quibusdam classibus condidit," &c. Ingen.

The outline of an arrangement formed by a naturalist so eminent as Klein should not be passed over unnoticed. All shells are divided by this writer into four principal parts, in the following manner:

 Pars 1. Coelidae, canales tessellati, circa principium teneus & clavati, in gyros gradatim vallories constanti ratione circumacti.

 Pars 2. Conchae. Tellae vesiculorum inflar expansi & concavi, variorum animalium extagnium habituaria, tellarum numero a se invicem differentes.

 Pars 3. Polyconchae, qua pluribus valvulis quam dubius gaudet.
The "Cochlodon," of the former Nautilus, is also the subject of a curious paper, "A Monograph of Cochleodons," by J. H. Cohn. It is printed at Hamburg in 1749, and contains a description of the shells of the Nautilus, and their anatomy. The author has treated the subject in a very scholarly manner, and has given a list of the species, with their characters, and their distribution. The work is well illustrated with plates, and is a valuable contribution to the knowledge of this group of shells.

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Linnaean productions on the subject of testacea; it appeared in 1767. In the interval between the times in which the two last mentioned works were published, Linnaeus brought out a third edition of the "Famia Suecica," in which the number of shells described was augmented from sixty to eighty-nine species.

The "Mantissa Altera" contains thirty-five species not described in the other works already mentioned. The "Fundamenta Tellacologia" is one of his latest tracts, and is to be found among the "Differtaciones Academicae."

There are valuable books in a limited view, but the classification of shells in the "Sytema Naturae" from the nature of the undertaking is to be considered the most general of all the Linnean writings on the tellacea. Between the year 1735, in which that work first appeared, and 1767, the Sytema passed through no less than twelve editions, in all of which a progressive improvement, and nearer approach to perfection are manifested, and in no one department is this more unequivocally shown than in the methodical distribution of the shells.

An opinion is pretty generally prevalent that less attention was devoted by Linnaeus to the history and arrangement of the tellacea, than any other order of nature; and that he even thought them unworthy of becoming objects of scientific arrangement. These points have been contested. The truth however still appears to be, that Linnaeus had not really bestowed much critical attention on this subject. We can easily imagine that the mind of Linnaeus might fluctuate between the propriety of establishing his conchological system upon the characters of the animals, and the difficulty, if not impossibility, of accomplishing it, and that in this state of indecision the shells themselves were, in a great measure, disregarded by him. When therefore the completion of the Sytema required that some attention should be paid to tellacceology, he was unprepared, and reporting to the authorities of others, comprized this department in the smallest compass possible, more with the view of filling up a chasm, which the omission of a tribe so generally admired would occasion, than from any idea of elucidating the subject.—A similar reason is well known to have operated on the mind of Linnaeus, with respect to his sytem of mineralogy, which was added principally, in order that this work should comprehend the three kingdoms of nature.

Whether this conclusion be correct or otherwise, one fact inferred is very obvious, that the early attempts at the classification of shells, which the Sytema presents, do not afford that happy result to be expected from the industry, and superior genius, of Linnaeus. — It is time we should lay aside the trammels of servile adherence, and speak decidedly:—those early attempts of this celebrated writer we do not scruple to say, if examined with candour, will be found only a flight and ill conceived compendium of what has been handed down to us by antecedent writers; and which, if he had more closely imitated in the outset, as he afterward found it incumbent upon him to do, would have rebound his reputation as a conchologist from considerable blame. Can we for a moment, dazzled with the splendor of a name, however dignified, deny that merit which is so conspicuously prominent in the classifications of preceding writers, and attribute all the credit of reducing shells into method and order to the genius of Linnaeus? or can we, after duly estimating the tellacceological labours, even of Gmelin, Aldrovandus, and Major, we would almost say of Arilitole, be disposed to commend this naturalist for overwhelming their arrangements in one common ruin; abolishing at the least forty excellent genera established by the different writers, and in lieu of those presented to us with eight genera for the reception of the whole tellacceous tribe! Yet such is the fact, the only genera of shells, included in the first editions of the Sytema, are cecoidea, nautiud, cypraea, basilare, denudata, conus, and liope.

Linnaeus was himself embarrassed in the distribution of shells into such a small number of genera; he even found it impracticable, and hence we perceive, in the later editions of that work, their number progressively augmenting till, in the last publication of the Sytema, they were multiplied to thirty-five. Thus from time to time, as his acquaintance with shells became more general, we see him deriving new strength and support, in the aid of his own sytema, from those very sources which, in the first inconsiderable, he too incautiously attempted to subvert: the genera afterwards admitted into the Sytema, even to those last adopted, being with scarcely an exception to the contrary, drawn from the labours of naturalists who wrote in the century preceding, or much before.

It is an opinion likewife founded in error, that we are indebted for the outline of this tellacceological system (considered in its most improved state) to the native genius of Linnaeus. No one will hazard the assertion, we should conceive, who is in the slightest degree acquainted with the writings before-mentioned. His primary divisions were ready formed to his hands. Let us examine further: in the outline of his sytema, he divides all tellacceous bodies into three principal orders, multivalve, bivalve, and univalve.

If we take the univalves of Arilitole (retained by later writers under the title of turbinata), the bivalves of all writers, from the time of Arilitole inclusively, and the plurivalves of Major, invert their order, and we at once possess the complete outline of the sytema attributed to Linnaeus. Or we may refer with equal certainty to the principles of Major's sytema alone, published sixty years before the first edition of the Sytema made its appearance, in which this inverted arrangement occurs precisely, univalve, bivalve, and plurivalve. Linnaeus, therefore, it may be fairly inferred, was not the inventor of the sytematic outline ascribed to him, for it was long in use before his time.

If we next descend from the primary divisions, or orders of the Linnaean sytema to his genera, these still are to be found in the same, or other early writers, perhaps a solitary transplantation (as in conus and strombus) excepted, and furthermore even under the very names he ascribes to them. His labours of the labours of Langius are too obvious to be concealed. But although, in this particular, Linnaeus has only the more moderate merit of adopting, instead of inventing the outlines of his sytema, he is to be applauded for having condescended to select what it appears he thought, on mature deliberation, superior to his own. And this, in our idea, was so far commendable, that we regret he had not been influenced by the same opinion in his first views of a tellacceological classification. Linnaeus had sufficiently much diffuse and ambiguous matter to wade through in his investigations of former sytema in general, and his selections were at length both clear and judicious, though still susceptible of much improvement. We are also to give the celebrated naturalist his full share of credit for having ultimately improved, and more accurately defined, the characters of the respective genera which he has adopted, than any of his predecessors; the characters of his species also, generally speaking, are not to be excelled for expressive fineness and conciseness. He may be truly said to have reformed the language of natural science, before much too vague, by the introduction of that peculiar brevity of style, so extreme,
ly useful in the nice differentiation of natural objects, and which he seldom fails to apply with the happiest possible effect.

The merits of Linnaeus, as a great naturalist, will shine with undiminished splendour, devvoted of its meteorous luster; the world feels grateful to his genius. But nothing less than an acquittance unworthy of his character, and of ourselves, can lead us to conclude he was equally successful in all his endeavours to develop the mysteries of nature. For our own part, attached to no particular fyltem, we would rather "tame the torrent alone, that glide down the stream with many," in contradiction to the evidence of our own mind; we are the friends of Linnaeus, and of truth. We are persuaded, furthermore, that what the result of calm investigation approves, must redound more to the credit of Linnaeus than that imputed to obversion which bows down our reason, and rejects inquiry. The celebrity so deftively acquired by his writings in general, has stamped his system of zoology with respect. Its reputation induces us to examine it with more than ordinary attention. It is in England, what that of Linnaeus's is in France, and some others in different parts of Europe; the system holds its own, and the more admired. We feel for this reason take a comprehensive view of the whole, regarding every genus separately in the same order as Linnaeus places them; and offering, as we proceed, a few original remarks on each, with a view to enable the commentator to form his own opinion, and judge for himself of the comparative excellence or superiorty of the Linnaean system of zoology.

The primary divisions of this system, in the latest edition of the "Systeın Natural," as before observed, consist of three orders: molusca, brachiates, and arachnides each of which is subdivided into genera. The molusca contain the chiton, lepus, and pholads; the brachiates, mya, solen, tellina, cardium, phoca, donax, venus, familylus, chara, areca, oliva, annuim, matthis, and plia; and the arachnides, argonauta, conus, cymus, cymop, bula, olata, haeccinum, laberum, murex, trochus, turbo, helix, teipia, halotis, patella, dentalium, derma, teredo, and fasa.

**Genus.**

**Chiton.** Animal a doris. Shell consisting of several transverse incumbent valves, disposed in a longitudinal series down the back.

Our knowledge of this genus was very confined till within the last few years; but lately in the tenth edition of the Linnaean "Systema Naturalia" appeared, only four of its species were known, at least no greater number is described by that writer. To the valuable work of Cuvier, we are indebted for the addition of thirteen other species; to Schafhei, for three or four; and to Pennant, for nearly an equal number; all of which are included in the last edition of the "Systema Naturalia à Gmelini," with a few others, amounting altogether to twenty-eight species. Though we are pleased to think such a number of the curious genus, concentrated in one pot of view, we cannot avoid expressing a wish that no few of the species at least were better explained, those especially which are confined to the continental museums; one, if not more of the species described by Pennant, is confusingly erroneous.

**Lepas.** Animal a triton. Shell affixed at the base, and consisting of many unequal valves. Linn.

The propriety of separating the balani, or worm shells, in the entomology, or as vulgarly denominated the "globe bearing shells," has never yet been questioned by any well-informed naturalist; although from motives of caution we, have, with others, submitted to the genus established by Linnaeus. But our reasons for differing from his authority (and which the Linnaean student might deem an innovation) could be explained in its proper place.

We were always at a loss to see the true reason that could induce Linnaeus to place their two very opposite natural families together; the only justification seems to be, that the animals of the two genera (for we shall denominate them) are of the same kind, and that no other multivalve shells are inhabited by this kind of animal, that of chiton being a doris, and of pholad an afide. At the same time, it will be remembered, that shells of the same kind inhabit shells of very different genera, and that it is therefore no argument, because all of the Linnaean genus lepas are inhabited by the triton, that they must be of the same genus. We cannot freely infer this from any similitude in the structure of the two kinds of shells. What, for instance, can be more different than the first very effusiusbular in particular, in which these shells disagree, namely, the manner in which they are disposed; the balani cemented immovably by its base to the rocks, bivalve shells, or any other extraneous substances, while the anarica are connected to, and supported at their base by a tendinous tube, which being of a flexible nature, allows the animal an opportunity of working or turning in any direction in quest of food. Again, the very differing circumstance, which Linnaeus had always himself regarded, as of the first consequence in an arrangement of shells, the presence and absence of the operculum; in the anarica, there is no operculum whatever; while, in the balani, that part constitutes one of the principal features of the shell; it is even the structure, rigidity, or other peculiar circumvolutions observable in this part, that afforded Linnaeus the best of his characters, in defining the species of this family. This operculum or lid of the balani consists of four or fix valves. The above characters are so obviously distinct, that it may be almost considered needless to advert to the form of the two shells, though in this also they differ most essentially; the anarica are wedge formed, and consist of five or more unequal valves; the balani of fix valves, and the general form of the shell is subconic.

**Pholas.** Animal an afideicia. Shell bivalve, decorated, with several leffer, differently shaped, accedent ones at the linge; hinges recurred, and united by a cartilage; an incrustation towards the inside beneath the hinge.

Their shells were formerly called picklocks by the English; they are found below high water mark burrowed in hard clay, lime stone, or sometimes free stones, and also wood; which they perforate in their younger state, and as they increase in size enlarge their habitations. The animal is somewhere cylindrical in form, and furnished with two orifices or openings, capable of eleyation in the manner of a proboscis; from one of which, supposing to be the mouth, it has the faculty of squirting water. The phosphorescent properties of the pholas are very remarkable; it contains a fluid which fluids with uncommon splendour in the dark, and illuminates whatever it touches, or happen to fall upon. This is used by Piran, lib. ix. ch. 61, and M. Remanus has also written copiously on this subject in the Memoirs of the French Academy, for the year 1712.

Only twelve species of this genus are described in the Genus of Syll. Nat. The pholadas were placed by Linnaeus among the bivalves.

**Mya.** Animal an afideicia. Shell bivalve generally gaping at one end, hinge, with a fold, thick, p.BLorous tooth, or seldom two, and not inserted in the opposite valve.
Many of the shells in this genus were arranged with the muscles till Linnaeus separated them; Gmelin, in the latter edition of the Systema Naturae describes twenty-one species of the mya tribe.

The Linnaean now constitute three distinct genera, in the late arrangement of the continental writers, as mya, glycimeris, and vulicula. The mya is distinguished by a transverse shell gaping at the two ends, and having the ligament within; and one valve furnished with a single, compressed, roundish tooth in the beak, perpendicularly to the valve, and having the ligament attached to it. The Linnaean mya truncata is of this kind. In the genus glycimeris the shell is also transverse, and gaping at both extremities, but the hinge is callous and toothless, and the ligament situated on the outside. Vulpella has the shell long and someweb equivocal; hinge callous, broad, without teeth, and forming a straight line in both valves; the ligament attached to a roundish corny hollow; beaks bent and very short. This bill genus is closely allied in many respects to the oyster.

Solæ. Animal an acrid. Shell bivalve, oblong, open at both ends; hinge with a subulate reeval tooth, often double, and not inserted in the opposite valve.

Gmelin describes twenty-three species of this genus, several of which are natives of Europe, where they frequent sandy shores. The Greeks were acquainted with some shells of this genus, as also the Romans. Both of whom valued the flesh of the inhabiting animal as a delicacy. In England they are occasionally eaten either boiled or fried without eggs, but are not found in sufficient plenty to be considered as an article of food. They are called frittate or razor-shells in this country.

The Linnaean solæ are divided by late writers on the continent into three different genera, two of which comprehend the recent kinds, the third is established chiefly for the reception of some fossil shells, supposed to be of this Linnaean family. Those genera are Tellina, Sanguinolaria, and corbula.

The solæ, according to those writers, have the shells transverse, with the upper and lower margins almost straight, with beads not projecting and gaping at both extremities; and the two valves together furnish either two or three teeth in the hinge, the ligament of the hinge in this family is placed between the valves. Sanguinolaria differs in having the upper margin curved, the extremities a little gaping, and two approximate teeth in each valve, which look into each other when the shell is closed. Corbula has the valves unequal, subtransverse, and regular; with a conic curved tooth in each valve; the ligament of the hinge within, and the inside of the shell marked with two muscular impressions.

Tellina. Animal a testace. Shell bivalve, generally flapping on one side; in the fore part of one valve a convex, of the other a concave fold; hinge with usually three teeth; the lateral ones smooth in one shell.

In the Linnaean system the tellina are divided into three families, namely, *ovata* and *tequilis, **ovata* and *comprell * ***subbivalvula.*

A late writer (Dr. Phipps) observes, in his "Catalogue of Shells found on the Coast of Dorsetshire," that the tellina genus is one of those of which the species are yet very imperfectly defined, arising from the great similitude among them; and from the insufficient descriptions of authors before Linnaeus wrote, who, by deducing their characters of the genus, if indeed such they might be called, almost wholly from figures, were necessarily led to throw together shells entirely different, when examined by the characters Linnaeus affixed. Those of this great maker, adds this writer, are yet very imperfect, and since the great additions that have been made to conchological science, by later discoveries, the whole system again wants a total reformation; and the conformation of many new genera. The observation of this naturalist is very just; the writers before the time of Linnaeus have, with too little caution, derived their characters from figures rather than from the shells, a fault we could have wished Linnaeus himself had more frequently avoided; the tellina of Linnaeus is a good genus, but requires to be revised; some of the shells included by this genus have certainly no natural affinity whatever with the others, and the character of the genus itself is not laid down with sufficient precision.

There is one of the continental conchologists who describes the tellina with any degree of accuracy; he defines them to be "shells shaped like wedges," and places them after the pins. (Vahl. iii. b. 2. sect. 8.) Woodward says they have a few teeth on the hinge, and are oblong shells, or with the files lengthened. Davila comprehends the tellina as a very large family, and includes the solæ as a genus of them. Da Cols, in his "Elements of Conchology," attempts to establish a family of tellins under the character of the shells being more broad than long, rather flat, and the hinge having two teeth set close together. This constitutes his ninth family of bivalve shells; and which he again divides into two genera, the shell of which he calls tellina, and the second, to his tellins are thus defined: "Shells with similar files, whose back hinge is central;" his cunei "shells with dissimilar or unequal sides, whose back and hinge are placed near to, or quite at one end."

There is much method, but very little accuracy, or attention to genera, founded on natural affinities and characters, in the arrangements proposed. It was refused for later writers, by a more strict inquiry into the nature and habits of the animals, as well as the nice discrimination of characters in the shells themselves, to fix upon definite general definitions. It has been discovered by Pohi, and others of the continental writers, that the animals inhabiting some of the tellin tribe are of a different fabrication from the others; and another objection to the tellina, as they now stand in that genus, is the difficulties observable in the hinge, teeth, and other parts of the shell, which Linnaeus has hitherto thought essential to be regarded in conchological genera. The principal of the new genera established by the labours of the French writers are *Cylus* (cyl CEOs) of Lamark, and *Pandora* (pandoros) of Lattreile, the animal of which was previously discovered by Pohi; the shell is also described by Linnaeus under the name of *Tellina inequivalvis.*

The tellina genus, as now defined, consists of those bivalve shells which are orbicular, or transverse, having a regular fold or rumple at the anterior end of the shell, with one or two teeth pointing to the beaks; and remote lateral teeth. This will comprehend the true tellina. The *cylus* is of the Linnaean tellin, and is exemplified in the *Tellina cornu* of Linnaeus and Pennant. This genus is of a suborbicular form, without a regular fold or rumple at the anterior end; the ligament of the hinge is inflated, and projects out; it has either two or three teeth pointing to the beaks, and lengthened lamelliform, or plate-like lateral teeth, which are received into sockets in the opposite valve. The genus pandora, as above intimated, is formed principally of that singular shell the *tellina inequivalvis.* This genus is univalve and unilaterally, one valve being convex, the other flat, with flattened *cornu,* two unequal diverging teeth at the hinge, pointing to the beaks in the upper valve, and two hollows in the lower; ligament within, and the inside of the shell marked with two muscular impressions.

Ceramus.
COPHOLGY.

Cardium. Animal a tethys. Shell bivalve, nearly equilateral, equi-valve, generally convex, longitudinally ribbed, dentate, or frilled, with the margin dentate. Hinge with two alternate teeth in the middle near the beak, in most incurved; lateral teeth remote, and inflected or locking into the opposite.

For each species of this genus are described in the last edition of the Systema Naturae.

Da Costa, in his "Elements of Conchology," proposes to establish a new family of cockles, under the title of peclinocolus, whose character is a curved or semicircular hinge set with either two or four teeth. These he divides into three genera. Genus 1. Pectinocolus, or cockles, with a convex or flat-sided shell, of a roundish shape, with similar or dissimilar sides, whose beaks are not very prominent, and curve much upwards towards the hinge; they are the Clamme of Argonauts and Guatier; and do not belong to any particular genus in the Linnaean system, but are dispersed throughout his bivalves, and are only mentioned here to introduce the two: next genera. Genus 2. Cardiformes, or heart-shaped cockles, whose beaks are not very prominent, and curve up greatly towards the hinge, thereby forming a figure perfectly like a heart as vulgarly painted. These are ranked by Linnaeus in the cardiac genus, and are theirs, strictly speaking, of which his genus is chiefly composed. Genus 3. Truncati, or flat-sided cockles. These are such cockles as are flattened, or have a truncated appearance on one side, as we see exemplified in cardium medium.

The cardium genus, as laid down by Linnaeus, is far from exceptional. It is adopted by the belw continental writers, under the title of Cardium butardi, Carys, Conus cerdiformes, and other significant appellations, alluding to the heart-shaped appearance which the shells exhibit, in a greater or less degree, when viewed sideways. These shells are of a somewhat cordiform shape, with the valves denticated or folded at the margin; beaks contiguous; hinge with two oblique teeth in each valve near the beak, locking into each other; lateral teeth remote, and fitting also into each other.

Mactra. Animal a tethys. Shell bivalve, unequilateral; valves equal; middle tooth of the hinge complicated, with a small hollow on each side, and lateral remote teeth inserted into each other.

Twenty-seven species of this genus are described by Linnaeus and Gmelin. Lamarck proposes to divide the Linnaean mactra into two genera, mactra and tarnaria; both shells are unequilateral, and gaping at the ends, but the constitution and situation of the teeth are very different, as we see elucidated most completely by comparing the mactra flutum of Linnaeus with the mactra lustra of the same author.

Donax. Animal a tethys. Shell bivalve, with the margin in general crenulated, the anterior end very obtuse; hinge with two teeth, a solitary one somewhat remote (the latter rarely double, triple, or none). Linnaeus.

This genus, in the Linnaean system, contains nineteen species. The donax of the modern continental naturalists is rather differently defined; they describe it as a transverse shell, with the sides unequilateral, a little gaping at both ends, and having two mucronular impressions in the inside of the shell; two teeth pointing towards the beaks in one valve, and a single bird tooth displaced in a similar manner in the other; and the ligament of the hinge on the outside. This character agrees with the Donax rugosus of Gmelin. Another genus is established under the name of petricola, the character of which is exemplified in the Linnaean Donax irus, and Venus vulgicida of Chemitz. The shells of this new genus are unequilateral, a little gaping at both sides, and having two mucronular impressions in the inside of the shell; two teeth pointing towards the beaks in one valve, and a single bird tooth in the other; with the ligament of the hinge on the outside.

Chama. Animal a tethys. Shell bivalve, anterior margin with two crenulate lips; hinge with three teeth, all which are approximate, the lateral ones divergent at the tip; "valva et anis difficilce." Linnaeus.

There are divided by Linnaeus into two sections; * pu- bentes, and * impubes, the last of which is subdivided into three families: † subcordata, ‡ orbiculata, and † ‡ ‡ ovalia, foro roman fabuganulae. The total number of species described in the "Gmelinian System," amounts to one hundred and forty-five. It is chiefly in the descriptions of the shells of this genus that Linnaeus has adopted terms which we do not feel at liberty to render into common language for the perusal of the general reader.

Many of the shells of this genus were arranged by writers previous to the time of Linnaeus under the title of chama. The animal is described as a tethys differing from that of the cardium, chiefly, in having the foot of the animal when protruded lamina-formed, instead of hooked, and as a mol luscan animal, taking a variety of forms when the creature moves. It should however be observed that we are yet very imperfectly acquainted with the animals inhabiting this extensive tribe of shells.

Spondylus. Animal a tethys. Shell with unequal valves, hard, and rigid; hinge with two recurved teeth, and a small hollow between.

The Linnaean spondylus are few in number, in the last edition of the "Systema Naturae," comprehending no more than four species. The spondylus have been by some called thorny oysters. Rumphius, Argovius, Siba, and Davilia, rank them as oysters; while Linnaeus, Guatier, Linnaeus, Mutschchen, and da Costa consider them as a distinct genus, under the name of spondylus. The spondylus are either ear-like or furnished with ears; the valves uneven, thick, and rude or uncouth, and forming in their general exterior an intermediate natural family between the oyster and the scallop. Lamarck, and other late French writers, divide the Linnaean spondylus into two genera, spondylus and plicatula. One essential distinction between these shells consists in the spondylus having ears, and the plicatula being without: but this is not the only difference. A striking character is drawn from the structure and appearance of the beak of the lower valve, which projects beyond the beak of the upper one, and in spondylus exhibits a plain triangular flat face, divided by a furrow: while in the genus plicatula the beak has no such characteristic face or flat surface, and the edges are rounded or folded. These new genera are well exemplified in the two Linnaean shells, spondylus gaedareus, and spondylus plicatula.

Chama. Animal a tethys. Shell bivalve, rather coarse hinge with a calous gibbosity, obliquely inserted into an oblique hollow; anterior hinge closed (valva clausa abique nymphia, Linnaeus.)

In da Costa's "Scheme of Shells," the Linnaean chama are divided into two genera, tridens or bracconum, and chama or papyrii. The tridenc are shells of equal valves, and dissimilar sides, in hinge and appearance like the heart cockles, but on the longest side from the beak to the extreme margin the two valves are open, leaving a large ovate or heart-shaped gap, the lips of which are very broad, and turn upon the edges. The chama gibbs of Linnaeus is of this family, and is the largest and heaviest shell at present known, weighing from six to seven hundred pounds. The chama,
The genus tridacna is retained by the latest French writers, with some amendment in the definition of the character. They describe it as an equilateral and subtransverse shell, with two compressed teeth in the hinge, and the lumen at the posterior slope gaping. The shape of these authors are adherent to other bodies, and have the valves unequal, and the lumen of each marked with two mucroniform impressions; and the hinge confining of a single thick obliqued tooth. Hippopos, cardita, and iofascia, are also new genera formed of the Limncean chame; the last is an excellent genus, founded on the peculiar structure of the chama cor of Limneus: this shell is heart-shaped, with the valve unequal at the sides; the beaks diverging somewhat spirally and remote; in one valve under the beak a flat tooth, locking horizontally between two in the opposite valve, and a single dilatant tooth in the anterior part, below the ligament.

Aeca. Animal a tethys. Shell bivalve, equiva!se; hinge with numerous sharp teeth alternately inserted between each other. This genus is divided into two principal families, these having the margin entire, and those with the margin crenated; and both families are again subdivided into two sections, the first distinguished by having the beaks recurved, the other inflected; the species described altogether amount to forty-two.

This genus derives its name of area, ark, or Noah's ark, shell, from the similitude which most of the species bear when the valves are closed to a boat, or hull of a ship, "concha rhomboidalis navicularum expressimus." Lillier places some of these shells among the multarticulate cockles, and the rest with the mussels, under the title of many-throated mussels. Woodward ranks them among his "polygyrini formae oblongae." Argenville as a family of heart-cockles, and Davila and Guiliéron as a distinct genus: the first under the title of area, the latter as "concha rhomboidalis." These writers were succeeded by Linnaeus, who considered these shells as a distinct genus, and called them arca.

The principal alteration in the Limneean classification of the genus area proposed by late writers, is to retain only such shells under the title of area as are unequalateral, with the beaks remote; and have the line of the hinge simple and straight throughout, with numerous teeth placed parallel to each other, and fitting or locking between those on the opposite valve. Admitting this as the character of the area, and it exactly corresponds with the area neoe, and most others, the little fibrous ark; area nucleus of Limneus, with its analogous species, is excluded. To comprehend the latter, a new genus is recently established by the French writers under the name of nuculine, or nucula, the character of which is remarkably decisive: it is described as a triangular or oblong shell, with the sides unequal; the hinge confining of an angulated, or broken line befit with numerous teeth, which are transverse and parallel, and a single oblique tooth placed under the beak, and out of the range of parallel teeth before mentioned. The beaks also, shielded of being remote in an area nuculina, are placed close together, and turn backwards.


These are divided into three families, * valves radiated and eared, as in the scallop; ** rough, or rough, as in the oyster, * * * hinge with a perpendicular furrowed line, as in the species perna and ifrigonum. The scallops are again subdivided into three sections, namely, those with the valves univalve, and the ears equal; those with the ears unequal, and having one of them generally dilated with the formes within; and those with the valves gibbons on one side. The two other families are not subdivided.

The difference between the oyster and the pechen tribe is so obviously implied by the habit of nature on the respective shells which compose them, that few writers on this subject have paused silent over the impropriety of placing them together. If, however, we examine a number of the other shells included by Linnaeus in the extenuate genus ostrea, many will be found, which though less distinct in the first view, equally deserving of being considered generally distinct, as well as the two tribes before-mentioned. The form of the shell is sufficient to guide us in an arrangement possibly of shells; but when the peculiar structure of the animal confirms the propriety of classifying new genera, no doubt can remain that such amendment was requisite. With respect to the ostrea, the animals of several of its natural families are unknown; some of the oyster and pechen tribe are, on the contrary, well acertained, and these are proved to be very distinct.

As Linnaeus considers these animals the same, and describes them as a tethys, it may not be improper to speak more fully on this subject. The scallop differs from the oyster in being endowed with a higher locomotive power: the animal is different in having the branchiae coriellated, or fringed; in being furnished with a kind of foot, which it protrudes from the shell near the auricle of the hinge; and in throwing out a byillus like the pinna and the mufles, by which it affixes itself to other bodies. Aritistic, and other ancient writers, attribute to the scallop the power of moving from place to place, a fact pretty correctly ascertained by the observations of the moderns. Argenville describes the process of its movements both in the water and out; he relates, that when wet dry, by a sudden and violent closing of its valves, sufficed by the foot, it has the power of springing four or five inches at a jerk, repeating this motion in order to regain its element. In the water, it is affected by this writer, the scallop has the power of rising and subsisting itself near the surface, turning about in various directions, and on any alarm suddenly closing the valves and sinking to the bottom. The oyster has the branchial simple, and not fringed, and is unfrustrated either with a foot, or with byillus; and its powers of motion consist in turning either the flat or convex side upwards or downwards, and even to effect this, the animal takes advantage of the force of the ebbing or flowing of the water to assist it. Vide Dr. Pultney's Cat. — Lilier on Scallop, in Phil. Trans. &c.

Before the time of Linnaeus, most writers considered the scallops and oysters as distinct. Guiliéron describes the scallops as a peculiar family, and divides them into two genera, or those with equal, and those with unequal valves; the first of which he calls pedunc, the latter concha pedunculata; and the scallops with unequal or single ears, he calls pedunculata. The oyster is ranked as a distinct family by most authors. De Costa observes that the "head or exint character of the scallop family is a trigonal frame, and an elastic cartilage for its hinge in the very centre of the top of the shell." "The oysters have unequal valves, though there are some species that have equal valves, but none are eared. The hinge of this family has not any teeth, but consists of one large inarticulate gutter, running the length of the top of the shell, in both shells alike, and is covered and filled with a strong cartilage." We should add, that in the
the scheme of classification by the writer, the spindle-
fish forms an intermediate genus between the ptilodons
and oysters.

In Lamarck's arrangement, the two genera, buitmus, oretes,
and pecon, ptilodons, are retained; but four other genera are
constituted, under the names of malacites, gunas, lirides, and
praelum, into which the Linnaean oretes are distributed. Lari-
troclae forms another genus under the name of grypus, the
trocha of living and fossil species of Linnaeus, a shell found only in a fossil
state. We are not exclusively indebted, however, to Lari-
troclae for the establishment of this genus. Vide "Donov.
Tour South Wales and Monmouthshire," in which the
course of an immense stratum of these antediluvian shells
is particularly described, with remarks on the genus oretes
and grypus.

ANOMIA. Animal, a ciliated flag-shaped body, with
bristles or fringe affixed to the upper valve; arms two,
linear, longer than the body, convoluted, projecting, alternate
on the valve, and ciliated each side, the fringe affixed
to each valve. Shell inequivalve, one of the valves flattened;
the other gibbous at the base with the shell produced, and
generally curved over the hinge; one of the valves often
perforated near the base; hinge with a linear prominent
carapace, and a lateral tooth placed within, but in the flat
valve on the very margin. Two bony rays for the base of the
valve.

Many of the Linnaean species of anomia are found in
送料 only, and rarely afford an opportunity of inspecting
their internal structure; neither is it reasonable to
imagine we shall ever become acquainted with the animals
by which they were inhabited. Our observations on these
points must be confined to the recent kind, only, which, so
far as they have been attentively examined, are found to
comprehend shells extremely dissimilar in structure, and to
be inhabited by animals differing in many essential particu-
larities. It is remarked by Dr. Pultney, that the animal of
the anomia is different from that of any other shellfish, and is
not reducible to any of those in a molluscan state hitherto
known. Hence, probably, the name Linnaeus imputed
comports anomia, "quasi irregularis dlimus a larga diferens.
" The animal of the anomia cepa is figured by Mur-
ray, in his "Considerations," vol. 2, p. 23; and that of another species, by Forkell, in his "Icones Animal-
orum," pl. 430. B, under the name of anomia tridentata.
The dissimilarity of these two renders it highly probable,
that in the different shells which come under the appellation
of this genus, the inhabitant animal is various. Linnaeus
describes that of the anomia tridentis as extending from
its body a tongue-like process fringed with fine hairs,
and furnished with two extensive ciliated arms, by which
it is enabled to open and shut the shell. In the anomia triden-
tata, the animal is furnished with two flat, wedge-shaped,
trilobated arms, placed opposite to each other; these it pro-
trudes out of the shell when it moves, and these are the organs
by means of which it moves in the sea. Some other kinds of
anomia are inhabited by animals which, it is supposed from
the structure of the shell, cannot open the valves so freely
as those, and are furnished with processes of a different
nature, which they protrude through the aperture or per-
forations at the base; and other kinds again, instead of
arms, have only a ligament passing through the perforations
of the shell, by means of which it is firmly fixed to other
bodies.

Columna is the first writer who speaks of shells of this
kind; he describes some few of the Shy tribe (the only
species known in his time) under the title of "Conchæ
radiores anomia." Hence the term anomia was afterwards
employed by other writers, and has since become the usual
name for this family of shells. Lithes figures some of the fossil
kinds in his "Appendix de Conchis" to his "Histoire de
Mollusques." Woodward forms an arrange-
ment of them under the name of anomia, ranking
them with the shells of unequal valves, in a chapter,
both valves convex, and one of them broken, and thence he
divides them into three families, the smooth, striated, and faceted. Gaspé-
tiery figures some few of the recent kinds as a new genus
under the title of terebrata. Argenville places some of the
anomia among his heart cockles. Davila treats them as a
genus of his biotters; Da Costa as a genus of bivalves
with unequal exils valves. The bank of the large or under valve
greatly produced, and rising or curving over the base of the
smaller or upper valve, which is pierced through like a
tube: the hinge is in articulation to the teeth, and they have
always a remarkable interior structure. These are the
terebra of some late writers, and comprehend only part of the
Linnaean anomia.

Thosc shells of the recent kinds among the anomia of
Linnaeus, which are most dissimilar in structure, are the spe-
cies terebrata, planeta, and epiphippium; each of which
stands at the head of a natural family, and offers characters
which may be adopted with facility as distinctions of innum-
ber genera. We are persuaded the genera formed by the subdi-
sion of the Linnaean anomia might be extended with much
propriety to a great number of shells, but we are unwilling to
reproduce them without the most absolute necessity. With
respect to the fossil kind of Linnaeus anomia, some may be
referred to the genera above mentioned, others are in no
manner applicable to them, and for the arrangement of such
it is requisite to form new genera. Lamarck proposes one
coloe, derived from the characters of the anomia tere-
brata of Linnaeus, and his genus cratera of the Lin-
naean anomia. Certain genera may be confounded as in a great
measure pertaining to the fossil shells only. These genera
are laid down with pertinacity; but Lamarck we are perfused
might have proceeded further. We consider Linnaeus
often times blamable for intermixing the recent and
fossil shells promiscuously together, and may embrace
ourselves excused sometimes at least for abstaining from
his example. Lamarck too differently; he approves this
method, and having ventured from the boundaries of the
present into the labyrinths of the antediluvian creation,
makes us expect a greater number of new genera
might have been established, those at present formed being
altogether inadequate to the reception of those numerous
remains of the terraque which are admitted among the
anomia of the Linnaean conchologist.

But to return to the recent anomia,—What, we would
inquire, might possibly induce Linnaeus to place that singular
bivalve, called from its transparency by the English col-
ever "the Chine glass window" among the anomia?
Or what signification can be more remote than the effe-
tial character of his anomia epiphippium et terebrata?—In the
first, which is to be found in his Systema under the name
of anomia planeta, both valves are of an equal size and
form; in epiphippium the valves are unequal, one being flat,
and in the other, as in the volva; in epiphippium the flat
valve is perforated with a round hole in the disk
near the hinge through which aavigent polices, and by
this means affixed to flows and other bodies; the A.
placenta has no such perforation. In A. teretabula there
is a perforation; but instead of being situated in the
flatter valve appears at the base of the straight tube as it
appears in the calcareous stone, which is elongated.
Near the hinge in one valve of A. placenta are two longitudinal lamell-
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Lamelliform processes, which approach near the beaks, and then diverge obliquely to as to resemble the letter V, and upon the valve opposite two corresponding processes longitudinally cleft, in which, when the shell is closed, two lamelliform teeth reposed. An internal structure of longitudinal processes occurs in the species terebratula, but very different from the preceding, and no such internal structure occurs in the anoma eclipsum. These characters denote fully evidently that they are not only essentially different in the conformation of their shell, but that they are inhabited by animals distinct from each other.

Mytilus. Animal an ascidia? Shell bivalve, rough, usually affixed by a beard or by filzus of fiky filaments: hinge in general without teeth, and except in a few species with a subulate excavated, longitudinal line, Linn.

The Linnean mytilus are by no means inconsiderable in number, and as they comprehend many shells very distinct in appearance, and some essential particulars, are necessarily distributed into several sections, or families, such as *paralitios, those affixed by claws, exemplified in mytilus crista galli; **planis, &c, flat, or compressed into a flattened form, and lightly armed, as in mytilus margariferus; or ***ventriculifur, ventricose, as in mytilus edulis. The older writers appear to be perfectly agreed as to the mytilus genus, but the moderns think it necessary to divide them into two or more genera. Lamarck separates them into mytilus (monk), *protomylus (monile), and *anodonta (anodonte). In defining the mytilus he notices in particular the unequalled, or claw-like termination of the shell at the narrowest end as a peculiar character. We do not perceive the absolute utility of his fectus genus, monile, though we think it admissible, but we perfectly agree in the adoption of the latter anodonta. This last mentioned genus consists of what are vulgarly called the river, or fresh water muscles, shells which we have always conceived it improper to refer to the same genus as the marine mytilus. In the colour of the valves, and form and situation of the beaks, the most obvious dissimilitude prevails, and a distinction still more evident resulting from the different conformation of the animal occurs in the inside of the shell, which exhibits three impressions of muscles or ligaments by means of which the animal is attached to the shells, while the shells of the common muscle, and its congeneres, have only one such impression.

Pinna. Animal limax. Shell sub-bivalve, fragile, erect, grasping, and furnished with a byfus, or beard; hinge without teeth, the valves uniting into one. Linn.

This genus is well defined; the shells of which it consists are wedge-shaped, or of a somewhat triangular form, widening from a pointed or narrow top to a very broad end. The hinge is inarticulate, the two valves being united in that by part, and thus forming, what Linnaeus truly terms it, a sub-bivalve, for it is not strictly of two valves, being thus connected. The pinnae are known by different writers under the various appellations of sea-hams, sea-wings, and pinnae marine, or by other fiky worms of the sea, which falt they obtain from the quantity of fine firon brown byfus, which the animals produce, and by means of which they affix themselves to the rocks; the byfus consists of fine fiky fibres of a brown colour, and which is easily woven into fluff or small articles of drefs. Among the ancient Romans this kind of fik was held in considerable esteem: it is even said that there are still manufactories of it at Naples, Messina, and Palermo.

Eighteen species of this genus are described in the last edition of the Systema Naturae.

Argonauta. Animal sepia, or clio. Shell univalve, spiral, involute, membranaceous, and unilocular, or consisting of a single cell. Linn.

The principal species in this genus of shells is the Linnean argonauta argo, the celebrated nautilus of Piny, lib. ix. 29, the animal supposed to have taught men the use of sails, and art of navigation in the early ages of society. The ancient knew this species by the name of nautilus, as appears sufficiently obvious from many passages to be found in their writings. Linneus, however, in conformity with Rumphius, applies the name of nautilis to a chambered shell of a very different kind, (sic Nautilus), and retains the nautilis of the ancients, under the title of argonauta, with the essential character above-mentioned.

In the Gmelinian edition of the Systema Naturae, the number of species described under the genus argonauta amount to five, argo, vitreus, cymbium, cornu, and arctica. But the minute observer of nature disposed to descend to the investigation of the microscopical kinds of shells will be able to add considerably to this number; a work published in Germany in 1728, the united labours of our friend L. A. Fichelt, and C. A. Moll, entitled "Systema Microsca" is a minutie examination of genera Argonauta et Nautilus ad naturam picta et descripta," contains in particular, a number of new species in this curious genus, and a few others are known to us which we have reason to apprehend have not been noticed by any other writers. By the accession of these latter species the genus becomes materially enlarged; but we have, at the same time, to observe that the whole of the Linnean shells, described under this generic title, are not strictly admissible among the argonauta, and that the removal of these will occasion a slight reduction of the species already mentioned. That very rare shell known among collectors by the name of glaftus nautilus, the argonauta vitreus of Gmelin, is separated by Lamarck from argonauta, and constituted a new genus under the name of carinaria. In the Linnean system it would be difficult to refer it with certainty to any genus. Linneus was himself in doubt where to place it, and at length referred it to the limpet tribe, under the name of patella crilata, but it cannot surely belong to this genus. In the last edition of the Systema Naturae, we see it transfused from thence to the argonauta with more propriety, but we are still perused it cannot claim a place in this genus, though it is more closely allied to it than any other of the Linnean genera; it is certainly of a new genus as Lamarck describes it. The principal distinction between these two genera, the argonauta and carinaria, is very striking; in the true argonauta, (or nautilus of the ancients) the spiral involutions turn into the opening of the shell, whereas in carinaria, the spire is situated at the summit of the shell and the mouth is entire. This character we think alone sufficiently decisive in defining the essential characters of the two genera. The carinaria is further distinguished by the shell being conic, and flatter at the sides, the spiral whorl very small, the back furnished with a single denticulated keel, and the mouth, or aperture of the shell, of an oval-oblong form, narrower near the angle of the keel. The argonauta shell, instead of being conic, is somewhat boat-shaped, and has from this very circumstance been named cymbium, both by Gauliciri and Tofin; and the dorsal carination which is single and denticulated in carinaria, is uniformly double and tuberculated in argonauta.

In conclusion of our remarks on this genus, it will be proper to observe that the glaftus nautilus, or carinaria vitrea, is one of the most choice and uncommon of the tellaceous tribe;
it is not, however, unique, for we know of three specimens, one of which is in the cabinet of Mr. Jennings in England, and the two others in the Museum of Natural History in Paris, one of which was obtained from Lyonet's cabinet. A large fossil shell of the argonauta genus, a singular species, and the only one we are acquainted with, occurs in the London Museum.

**Nautilus.** Shell univalve, divided into several departments, communicating with each other by an aperture or siphunculus.

The Linnean nautilus consists of two principal families, the one which are spiral and rounded, and such as are elongated and straight. Of the spiral kinds there are two distinct sections, the one of which have the whorls contiguous, the other the whorls separated; the nautilus of a straight form are comprehended in one section only.

Under the general title of nautilus, Linnaeus includes the three genera of modern naturalists, nautilus, spirula, and orthoceras, with some others which may hereafter, on accurate investigation, be found genetically distinct likewise.

The nautilus is a spiral rounded shell, having the last whorl very large, and enveloping the others, which are numerous, and divided internally into many chambers by transverse partitions, the dull of which is perforated by a siphunculus or tube. This character is drawn from the nautilus pomphilus of Linnaeus, a shell admitted by the latest authorities as an amplification of the nautilus genus; of the modern school only we would observe, for it has been previously shewn, under the genus argonauta, that it is not the nautilus of the ancients. The character of the new genus spirula, is derived from the nautilus spirula of Linnaeus, (erroneously readed spirula in Gmel. Syll.) or what we call the ram's horn. This shell is truly of the lituus or crozier family, being of a spiral structure with the whorls separated, and the last chamber at the aperture elongated into a spiral cylindrical form. Linnaeus describes only the spiral termination of the shell, which being of a concomerated or chambered structure, and perforated with a siphunculus; induced that naturalist to place it with the nautilis, notwithstanding the striking dissimilarity of the disposition of the spiral involutions. This shell, when perfect, affords an essential character which at once removes it from the genus nautilus, in which Linnaeus places it; namely the last or cylindrical chamber, which is alone sufficient to distinguish it. We may easily presume that no blame attaches to Linnaeus in this particular respect, for it is pretty certain that naturalist never saw the perfect shell. In collections we have at various times seen some thousands of the spiral terminations, (for it is a very common West Indian shell,) fearfully one of which has retained the lighted vigil of this chamber, though all appear readily broken, and different from a natural termination or aperture. This chamber of the shell is extremely thin and brittle, inasmuch that the slightest agitation of the waves will destroy it, and as those shells inhabit the deep waters, and are collected by the curious only from the **rejeâmentions** of the sea cast upon the beach in storms, it is natural to conclude that it is rarely found complete. It was not till of late years that the true form of the perfect shell appears to have been ascertained. The orthoceras is the orthoceras of Gaultier and Brynuius revived. This shell is straight or arched, and a little conic, with distinct chambers formed by transverse simple divisions perforated by a tube, which is sometimes placed centrally and sometimes laterally. We are of opinion this amendment would be improved by forming two genera of the orthoceras, one containing the straight and the other the arched kinds; and indeed we conceive fill further that those, with the siphunculus placed on one side, should form a distinct genus from those having the siphunculus in the centre. The Linnean character of the nautilus confounds all these distinctions; they are all nautilus of that writer.

Among the fossil genera remains of the antediluvian world, are many singular spiral shells, allied to, or of the same genera with the foregoing, and others which, though spiral and concamerated, cannot possibly be reduced to these tribes; such as the ammonites, the orbilutes of Lamarck, hélices of Guettard, facultes of Faujas, and the belenmites, or "thunder-bolts," of most authors. See article Fossils.

**Conus.** Animal a limax. Shell univalve, convoluted, and tuberated; aperture or opening affuse, longitudinal, linear, toothlike, with the base eftive; pillar smooth.

This genus is divided into five distinct families. **Truncatilis, having the spire nearly truncated.** **Pyriformes, with the base rotundate and sub-cylindric;** the cylinder half as long again as the spire. **Elongati, with the base rotundate, cylinder twice the length of the spire.** **Ventricosar, in the middle, and narrow at each end.** **Ventricosar, emits a tinkling sound, when thrown on its back upon a board or table.** The total number of species included in this genus, in the last edition of the Systema Naturae, amounts to seventy-one. Many of the conus, or cone tribe, are beautiful shells, and bear a high price on account of their rarity; the cedo nullis of Lyonet, valued at one hundred guineas, is of this genus. We have no species of this genus upon the English coasts. Some very curious kinds have been discovered in a fossil state in England, chiefly in the chalk cliffs of Hampshire.

**Cypræa.** Animal a limax. Shell univalve, involuted, subovate, obfute, and smooth; aperture affuse at each end, linear, dentate at both sides and longitudinal.

Linnaeus forms several distinct families of the cypræa genus, one of which is distinguished by being obtuse, and without any manifect spire; such, for example, as the species caput serpen tinus and tigris, the last of which is well known by the name of tiger cowry; another kind is perforated, or furnished with umbilicus, as in cypræa ziczac; and a third is margined like the common Well India cowry, vulgarly called "blackmoor's teeth," cypræa moneta of Linnaeus. In the young state, the cyprææ have much the appearance of a volute, and are entirely delinute of the thick denticulated lip or margin, so obvious in the adult shells. Writers have been even to far misled by this specious appearance, as to describe the young of several kinds for shells of the volute genus. The voluta junonis of Pennant's British Zoology, is clearly nothing more than the young of the common English cowry, cypræa pediculus, which that writer mistakes for a perfect shell.

**Bulla.** Animal a limax. Shell univalve, convoluted, and unarmed with teeth; aperture somewhat straightened, oblong, longitudinal, and very entire at the base; pillar lip oblique and smooth.

The arrangement of the bulla family is very confused in the works of the old writers. Littor makes them a genus of the cowry, and calls it concha veneris bali umbilicata. Grew and Bonnani place it with the fusæ; Argenville and Davila with the cochlea globofæ; and Gaultier as a genus between the paper nautilus (argonauta) and the cowries. The term bulla implying the bubble-like form, or swollen appearance of the shell, was applied by Rumphius to the bulla ampulla, from whom it was adopted by Kitin, and afterwards by Linnaeus as a generic appellation. The shells...
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included by this last-mentioned writer under the name of bulla, are more than commonly anomalous in habit and form; few instances can be adduced of greater dissimilarity than is observable between the bulla ovum, fuscus, terebellum, and virginica. The species ovum has the habit of a cowry, the fuscus that of a murex, the terebellum that of a cone, or a baccinum, and the virginica of a turbinated helix. The bulla adactyla, and other bulla cylindrica likewise offer characteristic differences, which may, without any impropriety, constitute generical distinctions.

According to Linnaeus, the animal of the bulla is a limax; but if it be such, as Dr. Pultney observes, in any particular species examined by that author, it does not hold throughout the whole genus; nor even in those which were primarily and eminently distinguished by the name of bulla. In some species the animal appears more to resemble an ascidia. The animal of bulla aperta forms a new genus in Lamarck's arrangement, under the title of bullae. The animal of bulla lignaria is furnished with miliary organs, consisting of three teflaccous bodies placed within the flomach or gizzard, by the help of which it is enabled to break small shells and hard substances. This instrument was first discovered by Pancesius in the bulla aperta, in which we ourselves observed it. An account of this in the gizzard of the bulla lignaria, by Mr. G. Humphreys, is inserted in the Linnaean Transactions. These latter mentioned teflaccous bodies were first introduced among conchologists as a new genus of shells by M. Gioe'ni, a Sicilian naturalist, after whom it was named gioenia, by Bruguiere. Retzius also describes it, but under the name of tricha. An account of the discovery of this important error, was published by Draparnaud, in the Bulletin des Sciences, n. 35.

VOLUTA. Animal a limax. Shell single-celled and spiral; aperture without a beak, somewhat effuse; pillar folded or plaited, and generally without lips or perforations. This extensive genus is diversified by Linnaeus into the following principal families. * Aperture or opening entire. ** Somewhat cylindrical and emarginate. *** Obovate, effuse, and emarginate. **** Fulfiform. ***** Ventricose; spheropapillary at the tip. The whole includes one hundred and forty-two species.

Linnaeus has deservedly incurred some blame for having too often transfused long established names from objects to which they were before assigned, and imposed them on others without any apparent or sufficient reason, which were never underlaid among his predecessors by those terms. An instance of this kind of innovation occurs to us at present. The term voluta, derived "a volendo forte revolutione spirali" was always applied to the cone tribe, and is very expressive of the peculiar rolled, or involuted structure of those shells; Linnaeus deprived them of that name, called them cones, and gave the title of voluta to the shells of which we are about to treat. The voluta genus, furthermore, as now laid down, is highly objectionable. Linnaeus, in the establishment of this new genus, has been less attentive to the natural families of shells than could have been wished, and has, by that means, brought promiscuously together shells which scarcely agree in any one individual respect, except in having plats or folds upon the pillar.

This error does not rest, however, entirely with Linnaeus, for he was not the original projector of the genus; he only adopted it, and gave it the name it now bears, when he might with more propriety have expunged it, or diversified the shells contained into other genera. In Lister's work, section ii. b. ii. a, we find a class of shells entitled, "buccina columelce dentata," in which that author arranges the buccina and other shells which have the pillar plaited. Linnaeus, by the adoption of this genus, under the title of voluta, comprehends a number of shells possessing very distinct generic characters, and which had been distinguished by his predecessors under the various names of oliva, rhombus, cylindricus, turbacillus, mitra, mafica, and others applicable either to their figure, or to the essential characteristics of their respective natural families. It is a singular corroboration of the accuracy of the ideas entertained by those writers, that the animals inhabiting the shells above-mentioned, have been recently ascertained to be as dissimilar in structure as the shells. Linnaeus considered the animal of all the volutes as a limax or frag; but from the investigation of Adanson and Argenville, and since the time of Müller, Poli, Lamarck, and many others, it appears that no opinion was ever more unfounded; the animal of each family being differently formed, and adapted to the peculiar shape or structure of the shell.

Da Costa, in his "Elements of Conchology," abolishes the Linnaean voluta genus altogether, but the shells are not restored to his method to their proper or natural families; his definitions want precision, and his scheme is confused and uncoath. But notwithstanding, the scheme of classification laid down by Da Costa was never acceded to by conchologists, and certainly never will now; from the circumference of its being the only elementary work in the English language (Barbot's Gen. Verml. excepted) it has answered one useful purpose, that of directing the general collector to dispose their shells into particular families, in a more comprehensive manner than could have been accomplished by attending to the Linnaean arrangement. Thus, in the Linnaean volute, the families are distinguished by the title of papal cows, Peruvian cows, mitra, olives, mitochondes, oysters, and other trivial apppellations, by which they are known even to this day among English collectors. As Da Costa derived his principal distinctions of these families from writers who flourished before Linnaeus, so also it has happened with the French conchologists; they disapprove of the Linnaean arrangement, but retain most of the original families described by those earlier writers, and thus we see at the present time the genera olive, turbinelle, mitra, harpe, &c, recalled and adopted with some improvements, by the best informed conchologists of that country.

BUCCINUM. Animal a limax. Shell univalve, spiral, gibbous; aperture ovate, terminating, in a short canal, leaning to the right, with a rectate beak, or tip; inner lip expanded.

The buccina are separated into secions, in the following order: * amputation, &c, inflated, rounded, thin, and sub-dichlamnous, and brittle. ** Cassidea, candaia, &c,; tail short, exerted, and reflected; lip unarmed outwardly. *** Cassidea, unguiculata, &c, lip acutated on the outside of the posterior part, otherwise retaining the left division. **** Cassidea, &c, pillar lip dilated and thickened. ***** Detrita, &c, pillar lip appearing as it worn flat. ******* Laviegata, &c, smooth, not enumerated in the former divisions.

Linnaeus has occasioned strange confusion in his classification of the shells which he denominated buccinum; in the indefinite latitude which his character of this genus admits, he embraces shells varying in size, whether they are bivalve or univalve. He has thus rendered the classification of this genus of shells highly objectionable. Linnaeus has, however, this advantage, that he has confounded altogether in this most copious genus, it is not sufficient that these be kept apart by being referred to different families, they should certainly constitute distinct genera.
The French have long distinguished these different shells, by the appellations of tumén, casque, harpe, pourpre, &c.; the English collector will better conceive, perhaps, what is meant by the trivial distinctions of tumis, partridges, harps, and whelks. In Lamark's arrangement, they assume a more classic form, and are defined generically, under the title of delum, harpa, cassis, terebra, purpura, bucium, and naria, as will be more accurately explained hereafter.

**Strombus.** Animal a limax. Shell univalve and spiral; lip of the aperture often much dilated, and produced into a groove leaning to the left.

Previous to the time of Linæus, the term *strombi* was applied to shells of a different description from those at present understood by that name. Under the title of *strombi*, the Greeks originally designated all kinds of turbinated shells. Among the older writers, the term *strombi* was indiscriminately employed as synonymous with turbo, trocirus, and sometimes with *murex*. *Strombi* was then a term indefinite, but rather applicable to the flender kinds, muriæ, or *rombi*

Linæus was the first who limited the application of the word *strombus* to those univalve shells, which have the canal or gutter directed to the left, and the lip expanded. He was not, however, the first to establish the genus. Lifer describes the shells of this family which have the lip entire, under the title of *purpura* seu *buccina* bilingua, and classifies them in the twelfth section of his fourth book. Ruppinus, and after him Maucliren, make a distinct genus of them, under the title of *alaia*, and by the same name alatus, they are pretty generally known to this day, it being well known that Solander intended to have established such a genus under this name. Davila ranks these winged alata among his muriæ, but independently, and as a distinct genus, consisting of simple or entire winged shells; placing immediately after them another genus, comprehending those which have the expanded lip digitated, or elongated into prong-like processes. Linæus rejects this arrangement of Davila, including in his genus *strombus*, the whole of those winged or alated shells; not in a promiscuous manner, but in sections or families, as *Digitatis*, libio in lacinis linearis ex:cut. *Lobati*, *Amphiatus*. The French writers to this time, on the contrary, follow the example of Davila, and form two distinct genera of these shells under the title of *strombus*, and *ptercera*, and to these another has been lately added after our countryman Lifer, under the name of *rotellaria*.

On this arrangement, the genus *strombus* is described as being a ventricose shell, terminated at the base by a short canal, flowing off or truncated: the right margin or lip dilating or expanding with age into a simple or entire wing-like lobe, and having a sinus beneath, distinct from the slope of the base, or in the Linæan language, the beak. This genus is sufficiently explained by the shell called among English collectors the "pugilist's fist," *strombus pugilis* of Linæus. The genus *ptercera*, has the shell ventricose, terminated below by a long canal; the right margin, or lip expanding with age into a digitated wing, and having a sinus near the base. The Linæan *strombus lambis* is of this genus. The generic character of *rotellaria* is drawn from the *strombus* satus of Linæus, described by Lifer, t. 854, l. 11.; and Martini, t. 159, f. 1500. The shell is full-form, terminated beneath by a canal, ending in a subdued or pointed beak; right margin entire or dentated more or less dilated into a wing-like process with age, and having a sinus contiguous to the canal or gutter.

We may hereby add, that the young shells of the *strombus* genus do not possess the striking peculiarity of the ample dilated lip before-mentioned, and that in consequence, such shells have been sometimes referred to very different genera, an error committed by some of the best among the early writers.

**Murex.** Animal a limax. Shell inequivalve, spiral, rough, with membranaceous futures; aperture ending in an entire canal; either straight, or somewhat ascending.

The Linæan genus *murex* is very extensive; in the latest edition of the *Systema Naturæ* a hundred and sixty three species are described under the following sections: *Spinolus*, *spinous*, with the tail (or beak) produced. *Frounolus*, futures expanding into crisped foliations; tail (or beak) abbreviated (vulgarily called *purpura*). *Varicolus*, futures rounded, protuberant, and thick. *Ecaudatus*, without tail (or beak) and somewhat spinous. *Caudigerus*, tail (or beak) subulate, clofled, straight and elongated; unarmed with spines. *Turriti*, tapering, subulate, with the tail very short.

The muriæ of the elder writers consist for the most part of such shells of the wheel or *bacina* kind as exhibited any considerable degree of asperity or ruggedness on the exterior surface; the Greeks having employed the word *murex* to express the roughness of rude stones or wall. Many of the Linæan muriæ are of that kind described by his predecessors under the name of *purpura*, the animals of which are spoken of by the ancients as being furnished with a tongue-like process, by means of which they are enabled to perforate other shells, and derive subsistence from the included animal. The English call the muriæ rocks, and the French in imitation, *rouche*.

Three genera of shells formed of the Linæan muriæ by the continental writers, claim particular attention; these are *falcioria*, *pleurotoma*, and a genus, retained under the name of *murex*. The first of these consists of such shells as the *murex* *tulipa* of Linæus are of a somewhat fulliform, or spindle shape; smooth or without roughness, and having upon the pillar two or three very oblique folds or pates. *Pleurotoma* is also of a spindly form, with the aperture terminating below in a long gutter or canal, and has the lip eleft or cut off in a slope near the summit. The third or *murex* genus is of an oval or oblong form, canaliculated at the base, and having the outside of the shell constantly belet with prominent longitudinal ridges, and for the most part with tuberculations, spines, or fringes. We cannot refrain observing that this, and perhaps some further amendments in the Linæan muriæ, were requisite to reduce them to lucid order; it will not we think admit of any doubt that the two first genera before mentioned, ought not to be arranged in the same genus with the muriæ, admitting the Linæan character of that genus as it stands in the *Systema Naturæ*. Linæus, it is true, included shells of both these families among the muriæ, but surely without sufficient attention to the generic character he had himself proposed for the murex tribe.

**Trocillus.** Animal a limax. Shell univalve, spiral, and subconic; aperture somewhat angular, or rounded; upper sfle transverse and contracted; pillar placed obliquely.

The trochi Linæus divides into three families: *umbilicati*, &c.; umbilicis, erect, and with the pillar perforated; as in the species niloticus and *peripherius*. *Imperforati*, &c.; erect, with the umbilicus clofled; as in *labio*. *Turriti*, &c. turritis, with the pillar exserted; shell falling on one side when placed on the base.

This is a long established genus of shells, having been adopted by the principal conchological writers a considerable time.
time before the Systema Naturae of Linnaeus appeared. Notwithstanding this, we perceive no small degree of difficulty arising in a general arrangement of shells from too strict an adherence to this genus as the character is proposed by Linnaeus. We do not object to the trochus genus altogether; it is an excellent genus in itself, so far as relates to the greater number of the conic species, which may be readily distinguished by their outline, but we cannot, it must be acknowledged, so easily reconcile our ideas to the propriety of including with these the turrited or tapering trochi of this writer; such as, for example, in the species telecopium, and others in that family. Furthermore, it may be added that some amendment in the distribution of these shells is rendered the more necessary for the sake of perspicuity in the arrangement of a number of new species not strictly according even with the former, and which have been discovered since the time of Linnaeus.

Lamarck, and after him Latreille, constitute a new genus of the turrited kinds of the Linnean trochi, under the title of pyramidalis, and which they define generally, as being a turrited shell, with the opening entire, and semiova; pillar projecting, raised, with three transverse folds, and perforated at the base. This genus is fully illustrated by the Linnean trochus dilabratus.

The new genus pyramidalis was certainly necessary; but besides this, the continental naturalists above mentioned, have indicated some other genera from the Linnean trochi, as polarium, and monodonta. The Linnean trochus perspicuus elucidates the character of the first of these three genera, which consists in being of a depressed conic form, with an umbilical opening in the base, crenulated along the inner margin of the spiral volutions, and the opening or aperture almost quadrangular. This is the shell known among English collectors by the name of staircase trochi, from a fancied resemblance of the internal view of the umbilical opening to a well, or spiral staircase. The shells are comprehended by Linnaeus in his first family of trochi; but we should rather incline to admit them as a genus distinct from that tribe, the depressed contour of the shell, and singular structure of the umbilical opening, forming an excellent general distinction. The Linnean trochus labio, and its analogous species, being of an oval or conoid shape, with the opening roundish and entire, but furnished with a projecting tooth, are the description of shells of which the genus monodonta consists.

Turbo. Animal a limax. Shell univalve, spiral, and foliol; aperture contracted, orbicular, and entire.

The shells of this genus are divided into five families; * neritoides, &c. having the pillar-margin of the aperture flat, or dilated and imperforate; ** foliis, foliis and imperforate; *** foliis, foliis and umbilicated, or perforated; **** cancellati, cancellati; ***** turriti proprii. (Negr.)

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The shell genus, as it stands in the Linnean Systema, is much too diffuse, and comprehends shells to very remote from each other in various essential circumstanc...
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mack, Latreille, and various other writers, and which we
cannot hesitate to admit as highly necessary. The distinc-
tions between these two genera are sufficiently characteristic.
Stomatia has the shell of an oval form, and ear-shaped,
with the spire prominent; the aperture ample, entire, and
longer than its breadth; disk imperforate, or without ori-
fice. Haliotis shell flat, ear-shaped, with the spire very
low, not almost lateral; aperture very ample, and longer
than its breadth, and entire; and the disk pierced with ori-
fices disposed in a line parallel with the left margin.

Lamarck, in his "Animal Architecture," places the halo-
ities, or ear-case, among the turbinate shells, between
the nerita and trochus; the same mode of arrangement is
observed in his work "De Animalibus Angulis," where he
says it is "spiral at the clavicle, in the three manner as other
larger shells, and is therefore placed erroneously by some
among the simple shells. Guénée ranks them among finalis,
with less or flattened spire; Adhemuz, in the first
family of spirals shells; Da Costa immediately after the
patella, his first genus of simple shells, and Lamarck be-
tween the tellaceae, which follows the helices and urteas,
and the vermiculaceae sculptura.

Some writers admit it as a collateral character of the
baliotis, that the inside is always of the finest pearl, and
pearls are often produced in these shells. The perfora-
tions vary in number in different species. It has been
observed, that the animal always closes one of those holes
towards the spire, whenever he opens another towards the
head as he grows bigger, and by that means that the num-
ber of openings is invariably the same in different individuals
of the same species. Shells of this genus are very rarely
discovered in the fossil; we much question if any of those de-
scribed by writers are truly of this genus.

Patella. Animalia limax. Shell univalve, sub-conic,
and without spire. Linn.

These are the limpets, and are known from their res-
semblance to a little plate, or patella, and are more or less
conic without, and concave within. Some have the apex or
top entire; others perforated: the chambered limpets are
distinguish by a peculiar kind of projecting process, or
lip within; most have the margins entire, but some have an
indent or fissure in that part; and again others are so com-
pletely spiral or wreathed in their exterior appearance that
they resemble rather the trochi, or top shells, than the lim-
pet. Linnaeus, in order to comprise shells so very dissimilar
in appearance under one genus, found it necessary to con-
tinue no less than five distinct sections or families for their re-
ception. Thence he arranges in the following order.
* Labiata, &c. furnished with an internal lip; shell en-
tire.
** Dentata, &c. with the margin angulated, and
-toothed.
*** Mucronata, &c. with the pointed tip recurved.
**** Integerima, &c. very entire, and not pointed at
the tip.
***** Perforata, &c. with the crown perforated.

Lamarck, as being one of the latest writers on this sub-
ject, defers particular attention; he divides the Linnaean
patella into six distinct genera, which he calls patella, filu-
rella, emarginula, conchoplas, crepidula, and calyptra.

The shells retained under the old name of patella (pa-
telle) are defined generally as being univalve, without
spire, oval, or fusiform, shield-form, or bonnet-shaped,
concave and simple beneath, with the summit entire, and
margin without fissure, as exemplified in patella telludinaria,
in the fourth Linnaean family. Fissurella (fissurelle) has the
shell shield-form, without any kind of spire, concave be-

mest, and at the summit an oval or oblong aperture. The
fissurellae correspond with the fifth of the Linnaean families
perforata, and with the genus formed by Da Costa under
the name of pierced limpets or mufita, in his "Elements of
Conchology." The little slit limpet, patella filula of Linnaeus, very clearly illustrates the genus emarginula (emarginul), of Lamarck; the genus is distinguished by the
shell being of a conic form, concave beneath, and hav-
ing the posterior margin cleft. The conchoplas has the
shell univalve, oval, convex above with the summit oblique-
ly inclined upon the left margin; the cavity within simple,
and two teeth and a finitude at the base of the right
margin. This genus is exemplified in the conchoplas per-
vulna of Pavanze, and buccinum lepas of Bruguiere.

Some other writers admit it as a family of the limpets which they
distingiuish simply by having the beam produced and some-
what twisted or crooked. The crepidula (crepilula) of
Lamarck is of an oval, or oblong form, with the summit
inclined upon the margin, and a partial simple diaphragm or
division in the cavity. The Linnaean patella porcelain is of
this genus. The calyptrae (calypticae) is of the chambered
kind, appearing in the first of the Linnaean families, and is
sufficiently explained by the Linnaean patella equilateral.
The shells of this kind are of a conoid form with the sum-
imt vertical, entire, and pointed, and the cavity furnished
with a thin plate, or tongue-like process in the centre,
which is either detached or connected to one side of the
shell, and runs in a spiral direction.

Dentalium. Animalia terellæ. Shell univalve, tubular,
slightly curved, with the cavity open at both ends, and
undivided. Linn.

The simplicity and precision of the generic character of
dentalium merits commendation, and, although some later
writers on the continent seem too fastidious to admit it, we
deem it unexceptionable. The shells of this kind are known
in England by the name of tooth shell. (Donov. Brit. Shells.) We have few species, and those are principally of
the minuter kinds, in this country. Gmelin enumerates al-
together twenty-one species of this genus, some of which are
found only in a fossil state.

Serpula. Animalia terellæ. Shell univalve, tubular,
and adhering. Often separated internally by divisions at
uncertain distances.

By the introduction of a few particular shells the Lin-
naean serpulae are rendered altogether incongruous. The
genuss, as now retained, is extremely vague; and which,
indeed, is necessary in order to comprise the whole of the
species described by Linnaeus under this general head. No-
thing absolutely certain is established for its character, ex-
cept its being an univalve shell, a circumstance common to
the greater part of the shell tribe, and its being tubular with-
out a regular spire, which is not less applicable to the dentala,
the teredins, and if, like Linnaeus, we admit the genus to
be really of the tellaceae tribe, the situation also.

What then remains to fix the character of a serpula? that it ad-
ters to other bodies, but even this is not always the case;
and beyond this we are again left in doubt, its character
being confusedly indefinite and local, "timp illa-
mis integris paullim intercepit," Linn. There are some-
times internal divisions at uncertain distances in these
shells, but what we can infer from these in constitut-
ging a generic character: these divisions are in the first place
concealed within the shells when entire, and are only to be
discovered by destroying them! and can this be considered
as a character well calculated to afford a generical cireteion?
Nor is this all, these internal divisions are by no means
constant; they are not as in the nautilus and other regularly
formed
formed chambered shells placed at equal intervals, neither are they pierced by a siphunculus, or pipe-like receptacle communicating from chamber to chamber for the reception of the linear body of the animal inhabitant; the creature must remain in the single chamber or enclose, having no means of extending itself into the rest of the shell. And besides this, the concamérations above-mentioned do not seem constant to any particular species, but depend on the age of the shell, and appear to be formed progressively at various intervals as the animal from various causes or its increase of growth finds it necessary to form a larger dwelling. In this case the deserted chamber left occupied being no longer useful is closed up, to render its new habitation more compact. We now advert only to particular shells; there are many species which do not exhibit such a concamérated structure.

One of the first writers upon this subject, after the time of Linnaeus, was Da Coila, who in his "Elements of Conchology" takes occasion to notice the manifest impropriety of uniting in the same genus the shell known by the Linnaean student under the name of ferpula penis, and the simple vermiculi.

He proposes to obviate the difficulty by constituting two genera, the vermiculi, or tubular worm shells, which have no fixed or regular form, as the common vermiculi, (ferpula vermicularis, Linn.) and penicilli, or those worm-shells which, in the whole, or any especial or particular part, have a determinate regular shape or structure. Of this last genus, he observes there are few species; the watering pot (ferpula plius, Linn.) from the East Indies is the chief kind, and when perfect is much valued. The propriety of dividing these families of shells is well conceived, but the distinctions are not happily defined than might be expected. The suggestion, however, of this writer has been improved upon by the later French naturalists. The genus arboefor or penicillus of Lamarck is the penicilli of Da Coila; and yet, in truth, we should add, that though the genus was laid down by Da Coila, we may trace it to Argenville, who had previously, say, even before the time of Linnaeus, described the watering-pot shell under the title of pennisculus marinus. The genus arboefor, or penicillus, as defined by Lamarck, is a good one, and the same may be truly said of the filanaria of Davila, a genus exemplified in the Linnaean ferpula anguina, which is distinguished by having a longitudinal sub-articulated opening or cleft, extending throughout the whole length of the shell. The concamérated ferpula, we have seen, are not to be regarded as generically different from the rest.

The vermiculi of Gualtieri include the Linnaean turbo scalaris, a rare spiral shell, better known in England by the name ofwentletrap, and which is esteemed of considerable value on account of its rarity. This writer places it with the vermiculi, because, as he observes, the spires of the shell are not produced from or supported by a peduncle, as is constantly the case in turbinated shells, but poise, on the contrary, the true character of the spiral worm shells; and there is certainly much truth in the ideas of Gualtieri, though we do not at the same time perceive the absolute necessity of removing it to this genus, and we shou'd anxiously and most fervently avoid any needless innovation. Lastly, we shall mention that the author of the "Tellacca Britannica" proposes as an amendment in the ferpula, to divide them into two distinct genera; the ferpula he retains under the old Linnaean character, "shell univalve, tubular, adhering, or affixed to other bodies; in some species divided into cells." The other he calls vermiculam, and defines "shell univalve, shape various; not attached, or adhering to other bodies." This we believe must in candour be admitted as more vague and indefinite than even the Linnaean distinction, and by the laxity of expression may as well apply to the whole tribe of univalve shells, the adherent ferpula excepted, as to the particular family called vermiculam. But though we disapprove of the character assigned, we perfectly agree with the ingenious author as to the propriety of separating the adhering kinds of ferpula from those species which constantly occur detached.

**Teredo.** Animal a terebella, furnished with two calcareous, hemispherical valves, or maxille, truncated before, and two others of a lanceolate form; shell tapering, flexuous, and penetrating wood.

The animal inhabiting this shell is a terebella of a particular kind; the body being of a soft and gelatinous nature, but having the head provided with an instrument of a calcareous substance, which performs the office of an augur, and enables the worm to penetrate the hardest oak. The most destructive of the animals of this genus is the teredo navalis, which penetrates the bottoms of ships. It was originally imported from India into Europe about seventy years ago. Sell us, in the year 1753, published a treatise on this subject under the title of "Historia Naturalis Teredinis, seu Xylophagi marini Tubulo-conchoidis." It was afterwards described and figured by several writers, and among others by Bailler, in the Philosophical Transactions, vol. xxxi. It is now too well known by the name of **shipworm.** See Donov. Brit. Shells.

Three species only of this singular genus have been yet discovered, and which are named navalis, urticula, and clava. Pavanoe and Guettard divide these shells into two genera, teredo (taret) and filuliana; the shell of teredo is distinguished as being tubular, cylindric, and open at both ends, lower orifice furnished with two lozenge-shaped valves, and the upper with two spatulate operculas. Filuliana is a genus composed of a single species, teredo clava, Gmel.: the shell is tubular, elevated at one end, open at the flender extremity, and containing in the cavity two non-adherent valves. This last is called by Pavanoe, filuliana cornicula, and filuliana gregata by Guettard.

**Sabella.** Animal a nereis, with ringent mouth, and two thicker tentacula behind the head: shell tubular, composed of plates of sand, broken shells, and vegetable substances, united to a membrane by a glutinous cement. The fabela, according to Linnaeus, is inhabited by an animal of the nereis kind. Some of these animals were known among the old writers under the name of sea scolopendus. Since the time of Linnaeus, the number of species has been greatly augmented by the discoveries of Faisas, Fabricius, Müller, and others, and the nature of those animals become better understood; in consequence of which, they have been discovered to be the habitations not only of the nereis, but also of the amphitrite and terebella genera. We speak of the marine kinds: with respect to several of the supposed species of fabela found in fresh water, it is accurately determined they are not of this race of animals, but the larvae of ephemere, phryganea, and other insects, which contrive cylindrical cells of extraneous matter, in which they reside while they remain in that state in the water. Some naturalists, in order to avoid confusing these larvae with the true fabela, have cautiously omitted the whole; and we indeed suspect, that although they may continue to be retained by the Linnaean student among the shell tribe, they will be expunged, or many of the species at least, by future sistematics. The Gmelian system comprehends 25 species.
Species of shell, the fresh-water kinds, described by Schroetter, included.

The marine shellfish shells are composed chiefly of sand and the fragments of shells; those of the supposed shellfish found in fresh-water, either of small fragments of vegetables, or the broken shells of tectaceous vermes, those of the helix tribe especially.

Having presented the reader with a detailed view of the Linnaean system of conchology, we shall next proceed as before to speak of the other principal writers on the subject, as nearly in chronological order as circumstances will permit.

The third volume of the extensive and costly work of Seba, "Descriphtio Thuefani Rerum Naturalium," was produced at Amsterdam in 1758. This part treats on marine subjects generally, as crustaceans and tectaceous animals, corals, &c.; and contains besides plates in other departments, sixty-one elucidatory of conchology. As a book of reference to the more striking and well-known kinds of shells, the work of Seba possesses merit; it has been observed, and with much truth, that this valuable publication might however have been rendered less expensive by the omission of a number of figures, which conflict merely of repetitions, and also the specimens of art abundantly introduced, such as the fanciful decorations on the shells of the nautilus, and the examples of "shell work," on which a profusion of engraving is unnecessarily expended.

In the "History of Cornwall," Dr. Borlase presents us with a plate of shells containing about thirty species; the descriptive matter is slight, and is principally copied from some of the oldest writers on the subject. This was published in folio in London, A.D. 1758.

The magnificent work of Francois Michael Regenfus, "Choix de coquillages et de crustacées," appeared at Copenhagen, under the patronage of the king of Denmark, in the same year as the preceding. The work comprises twelve coloured plates in imperial folio, and each plate comprehends twelve shells. The descriptions, which are written both in the French and Danish language, are the joint labours of prof. Franz Kratzenhnen and Dr. Alcatus. It has been lamented that the talents of this artist were not employed on subjects better deserving of elucidation, as those which are figured by Regenfus fall daily under the notice of the most humble collectors. A second volume was begun, and considerable progress made in it before the year 1779; but as the artist is no more, the undertaking is in all probability relinquished. Twelve plates designed for the second volume are possessed by sir Joseph Banks, and which include shells of greater rarity than those inserted in the first volume.

We have already adverted to the "Claf's Conchylorum" of Carolo Augusto de Bergen, published at Nuremberg in 1760. This little treatise contains a compendious view of the principal systems of conchology which had then appeared, under the heads of "Methodi Universales," and "Methodi Particulares," with concise prelatory structures on each. These remarks of Bergen have evidently furnished later writers with many useful criticisms on the several works that fall within the compass of his view, and may, upon the whole, be thought far preferable to many more elaborate observations that have since appeared on the same subject.

The "Amusement Microcopique" of Ledermuller relates to minute shells, and contains many figures. The first part was published at Nuremberg in 1764, and in 1766 and 1768 two other parts of the same work.

Davila's "Catalogue Systematique et Raifonné des Conchylidés de fon Cabinet" was printed at Paris, in 1767, in three volumes octavo, preparatory to the dispersion of his collection in the following year. The first volume treats entirely of shells, and contains twenty-two plates of the rarer specimens in his cabinet, many of which are scarce even at this day. This work affords much interesting information, though it is to be considered only as a file catalogue. The same year a similar production, "Catalogue Systematique des Coquillages de Arnold Leers, de Rotterdam," appeared at Amsterdam, as an announcement of the sale of his valuable collection. This was written by Mr. F. C. Meinheer, German envoy at the Hague, and contains a sheet of shells.

The work of Geoffroy, "Traité des Coquilles, tant fluviales que Terrestres, que se trouvent en Environs de Paris," was printed in 1767, and forms a valuable acquisition in this department of science. Three plates engraved by Duchoef, contain figures of forty-six shells described by Geoffroy.

A curious and interesting paper by Hering, occurs in the Mem. de l'Acad. des Sciences, for 1768, entitled, "Éclaircissements sur l'Organisation jufqu'ici inconnue d'une Quantité considérable de Productions Animales, principalement de Coquilles des Animaux," with eight illustrative plates, three of which relate to shells. In the same year the "Memoire sur le Coquillage appelé Dette en Provence" of A. D. Fourgeroux de Bondaroy, was inserted in Mem. Etrang. de l'Acad. Roy. de Sc. together with a plate elucidatory of the subject, which is the Linnaean mythus lithophagus.

Cotte's observations on the physiology, &c. of the shell, occur in the "Journal de Scavans" for 1770, and in the "Journal de Physique des Dépôts des Yeux, et de l'Eléphant" of Knorr, completed in 1773, consist of six parts, and altogether contain 975 figures of shells. The author was a painter at Nuremberg, and his publication commenced in 1763; but not living to finish the undertaking, the last part was brought forward by his executors. Knorr had collected materials for another tectaceal work, his "Delicais Nature fechez," which was afterwards prepared for public view under the direction of Müller and De la Blaquière.

Another conchological work, of still greater extent, "Neues Systematisches Conchylcien-cabinet," was in a progressive course of publication at Nuremberg, about the same period. The first part appeared in 1769, another in 1771, and a third in 1777. These constitute the first three volumes, which were all its author, Martin, lived to complete. Seven volumes have been since added by F. H. Chemnitz. The body of the work is written in the German language; the embellishments consist of 366 plates, and exhibit a number of figures on each plate. It is highly probable this work will never be extended beyond its present limits; Chemnitz being dead, and his collection of shells, which was very copious, having been dispersed within the last four years by public sale. The catalogue of sale bears date Feb. 7, 1803, it was drawn up by H. S. Holten, in a small duodecimo, entitled, "Enumeratio Systematica Conchylorum J. H. Chemnitzii," &c.

Schröter is the author of many treatises on the subject of shellfish, and which appear to be little known. He has in particular distinguished himself by his observations on the river shells of Thuringia; the source from whence Gmelin has obtained many of the new-species described in his edition of the Systema; the labels of this writer are very numerous. See his "Die geschichte der Pluonconchiden, mit vorzüglichlicher rückicht auf diejenigen welche in den Thüringischen
which wasser leben," 1779. This was preceded by a small publication on the land shells found chiefly in the neighbourhood of Thiangfladt, "Verfich einer Systematischen abhandlung über die Erdkonchylen um Thiangfladt." A later production of this writer's is the "Einleitungen in die Conchylen kenntniss nach Linnee," published in three volumes octavo, 1783-1786, and which to the German scholar forms a valuable introduction to the study of conchology.

The "Zoologie fundamenta" of Martinus Thane Brunnich, was published in 1772, and relates in a partial degree to shells.

In the "Verrnimus terestrium et fluviatilium Hiloria" of Müller, we are presented with an arrangement of land and river teleoconous animals divided according to the characters of the animals themselves instead of their shells. The first volume was begun in 1773, and the second in the year following. The teleological productions of Denmark are described in the "Zoologia Danica" of this author.

The "Viaggia in Dalmazia," or travels in Dalmatia, by Albert Furti published at Venice in 1724, contains a few figures elucidatory of those shells which he found in the Porto di Buri.

The "Elements of Conchology," by Da Coa, was published in 1756. This work presents us with a new arrangement of shells, and besides contains some judicious observations on the classification of Linneus, and some other writers; which latter, in our opinion, deserve more attention than his system of shells. The "Elements" of this writer is one of the most inferior of this author's works. His "British Conchology," published in 1758, is more valuable, though it does not take a sufficiently extensive view of the British teleoconae. Da Coa had intended to publish a second edition of these with considerable improvements; the collection of materials, and the MS., for which are in the possession of Mr. Donovan, and have been in part incorporated into his "Natural History of British Shells." The great force of Da Coa appears to be in the antennial race of shells, and other extraneous fossils, and in the more useful departments of mineralogy, or what he denominated native fossil. Upon these subjects alone, no less than ten volumes of unpublished manuscripts are preserved at this time in the extensive collection of original MS., &c. formed by Mr. Donovan, which are intended to be placed in the library of his museum.

Among the few teleological works noticed by Da Coa, in the introduction to his "Elements," he speaks of "a new and anonymous conchology, began to be published in this metropolis, in 1779, in folio, illustrated with copper plates," "it was intended (he observes) to be a general natural history of shells, and to include figures of all the known species, common as well as rare, beautiful or otherwise, and some copies were designed to be accurately coloured for the use of the curious. This anonymous production was, to our knowledge, written by Da Coa, and was the joint undertaking of himself and Mr. George Humphrey, by the latter of whom most of the shells were furnished that are described in this work. The numbers of this work that were published comprehended the first three families of its system, limpet, sea ear, and terebra.

The publication of Ignaz Edler von Born, the celebrated mineralogist entitled "Index Rerum Naturalium Mafeli Conchae Vindobonensis" presented the public in 1788 with the description of the shells preserved in the museum of the empress queen at Vienna; and was undertaken at the express command of her imperial majesty. "Two years after the baron published his "Telea Conchae Vindobonensis," as a splendid illustration of his former work; this contains about two hundred coloured figures delineated in eighteen folio engravings.

The early editions of the "British Zoology," as it is entitled by Mr. Pennant, though in reality it embraces only an inconsiderable portion of the zoological productions of Britain, include none of the tellaceous tribe: these were added in a fourth volume published in 1778. This volume contains an enumeration of 163 species of shells with concise descriptions, and 56 plates exhibiting figures of nearly all that are described. Mr. Maton oberves in his comments on this work that "most of the plates are valuable for reference, but some of them are executed less carefully than could have been wished. In the descriptive part (says the doctor) the author has transmitted pretty chiefly the specific characters, given by Linneus, whenever they could be had, but there are several species of which the former is to be looked upon as the first definer. It is very remarkable, however, that he should have wholly omitted which had been noticed by Lithé and Petiver, and others which are unquestionably natives of our island." The number of British species of tellaeae known to us at present amount altogether to several hundreds more than Mr. Pennant was acquainted with, and it is our knowledge of these which renders his catalogue of little moment.

But we ought in candour to allow that considering the very low ebb of natural science in this country at the period Mr. Pennant wrote, his work is a respectable performance; we mean with regard to the number of species contained. The defractive matter certainly betrays great want of information, as well as Science: many of the synonyms are misapplied, and the names erroneous.

The "Observation fur les moules" in the "Journal de Physique," 1779, is from the pen of a lady, Madoonde Collot, and relates to the reproduction of mussels. Desquesne treats upon the locomotive faculty of oyters in the same volume of this journal "Sur la Faculte locomotive des huieres," p. 241. tom. 28.

In 1780 the "Pataf Gramslandica," of Otto Fabricius was printed at Leipzig. This work contains the description of fifty-seven species of shells found in Greenland, among which are a number not previously observed by writers. Fabricius pays considerable attention to the structure and habits of the animal as well as the shell.

The "Zoophyllum Gramsianum," a description of the rich museum of L. T. Grouvino senator at Leyden was published in 1781. There are in this work a scientific description of 789 species of shells, and among the plates, two appropriated to the illustration of the rarer kinds.

Molina's "Saggio sulla flora naturale del Chilli," or natural history of Chili, comprehends descriptions of the shells observed by this writer in that part of South America. The work was printed in octavo, at Bologna in 1782.

A small octavo tract was published at Naples in 1784 entitled "Dificerzione di una nuova famiglia, e di un nuovo genere di Tellacce, trovati nel littorale di Catania, con qualche osservazione sopra una specie di olliche," by M. Gioeni. The supposed new genus of shells which occurred to the notice of Gioeni on the shores of Catania was no other than the land teleoconous faunace found in the gizzard of bulla liguria, a similar organ to which we have ourselves found in the gizzard of bulla aperta. Some years passed before this misconception was detected; it had been really considered a shell by profilo Ratti from whom it obtained the name of tellaeae Gioeni; and it is arranged also in the system of Brugniere under the name of gioeni scula.
C O N C H O L O G Y.

ficula. M. Draparnaud claims the merit of having first ascertained the real nature of this teledacous sublance, an account of which he inserted in the Nouv. Journ. de Physique. We should add that the same article is deficient and illustrated with figures in the second volume of the Linnean Society by Mr. G. Humphrey, associate.

A variety of new and very curious experiments by the indefatigable Spallanzani on the reproduction of the head of the common flea is recorded in two memoirs, the first of which was published in 1782, the other in 1784. See "Rifultati de Esperienze sopra la Reproduzione della Testa delle Lucane Terrestri," Mem. della Soc. Ital. t. 1. Part. 2. pag. 556.

The splendid work on shells by Martyn entitled the "Universal Conchology," was begun in the year 1781, and was continued to be published at uncertain intervals till 100 plates appeared, when its progress was finally impeded. This work commenced with the non-descript shells collected in the different voyages of the English circumnavigators in the South Seas; many of which are still esteemed valuable, while others, as may be imagined from our more habitual intercourse at this time with the southern hemisphere, are become common. As a scientific work, this performance will be found altogether defective, and it is besides too barren of general particulars, to render the subject pleasing to the common reader. Much greater praise is due to the plates, which are the productions of Grozier, and many other artists, and are for the most part well executed; it may be indeed added, that they are the representations of objects in themselves so beautiful as to afford the artist every facility in the display of talent. A number of the original specimens are in the cabinets of Mr. Wood, apothecary, Mrs. Forster, and others in London.

A small quarto treatise embellished with three plates, the joint labour of Mr. W. Boys, and Mr. O. Walker, appeared in London in 1784. The work treats only of microscopic shells, and the references of its authors were confined to the sandy shores of Sandwich as the title indicates. "Tellurica minuta rariare superum detecta in arenâ littoris Sandwichiae." It is dedicated to the late duchess of Portland.

In the Philosophical Transactions for 1786 is "an account of some minute shells, either not duly observed, or totally unnoticed by authors." This is illustrated with three plates and is the production of the rev. Mr. Lightfoot, the learned author of the "Flora Scotica," to whom the world is so highly indebted for his indescribable inquiries respecting the British fungi and conifers.

In 1786, C. L. Kämmerer described the collection of the hereditary prince of Schwarzburg-Rudolstadt. This catalogue is in the German language, and is embellished with twelve plates; it bears the title of "Die Conchlien in Cabinet der Herrn. Erb.—Prinzen von Schwartzburg-Rudolstadt. An appendix, with four additional plates, was published at Leipsic in 1791, under the title of "Nachtrag zu der Conchlien un Fürstlichen Cabinet zu Rudolstadt."

The "Journal de Physique" for 1787, contains a description accompanied with figures of chiton squamosus by Lefèbvre des Hayes.

In the Travels of the Russian Academy, for the year 1795, we find a memoir of teledacous, entitled "Marina variis, nova, et rarioris," by Pallas. The subject treated of are fornpila piriformis, large carola, pholos teredula, chiton amiculatus, and helix coriacea. This author had previously distinguished himself by his critical writings on conchology, both in his "Spicilegia Zoologica," which appeared in 1780, and his "Miscellanea Zoologica," published some years before.

Retzius in the same year printed his "Nova Teledacorum Genera," a work in quarto, in which many alterations and improvements on the Linnean system of conchology are projected. It was previously the subject of an inaugural dissertation at Lund. Retzius was likewise the author of a description of Venus Iphithyphora, published in the Memoirs of the French Academy for 1786.

Cordier's work of "Remarkable Runs and Romantic Prospects of North Britain," appeared on upwards of a hundred folio, and besides the views comprises some plates of natural history, among which are a few of the more remarkable species found on the coast of Scotland, grouped with a variety of other marine productions. Antiquity is however the leading feature of this work. Only part of this production appeared in 1788; some additions have been made to it since that time.

In the year 1789, Bruguier, the well known traveller in the eal, commenced the teledacous part of the grand work, carried on in France, under the title of "Encyclopédie Méthodique," but unfortunately for the cause of science, this fluky naturalist lived only to complete the first volume, which does not go beyond the letter C. of the article veras (worms). The prefatory matter to this volume contains the method of an arrangement he intended to pursue, founded principally upon that of Linnaeus, with such additions and deviations only, as he conceived to be required by the discoveries of other naturalists since the publication of the Linnean Systema. This is the principal, though not the only production, on the subject of conchology, Bruguier submitted to the world.

A pleasing variety of beautiful and curious species of teledacous tribes, chiefly the extra-European kind, have been introduced, at various times, to the notice of the English reader, through the medium of that well known periodical undertaking the "Naturalis Miscellany," of Dr. Shaw. We are not a little surprised indeed to observe, that the greater number of univalve shells in this work are reverenced in the plates, and are therefore likely to mislead the incautious observer into a persuasion, that they are in reality heterostrous. This work commenced in 1790, and still continues in a progressive course of publication.

The "Zoologia Adriatica," of Abbé Oliver, printed in 1791, contains an account of the shells found in the gulf of Venice, with a series of engravings, to illustrate some of the more remarkable species. In the "Ann. de Chimie," for the same year, M. Vaucqualin treats of the respiratory process in the helix pomatia, and proves in the course of his observations, that the venes require vital air for the excitement of their pulmonary system as well as other animals. The species above mentioned (according to this author) will replire azotic and carbonic acid gas, as long as any oxygen remains combined with either. The "Observations sur la génération des Buecins d'Éau douce," by M. Ribaucourt, inserted in the "Journ. d'Hist. Nat." for the same year, tend to prove that all the species of that tribe are viviparous. The bulk we have to mention in this year are the papers of M. Cuvier, the celebrated comparative anatomist. These relate to the anatomy of the Linnean patella vulgaris, and unguis; and the bala apera, and are to be found in the "Annales du Musée Normand." The first volume of "Teledacographia et Zoophytographia parva et microscopica," by Am. Soldani, is dated 1789; a second volume appeared in 1795. The microscopic subjects, described by this writer, are principally shells discovered.
CONCHOLGY.

discovered by himself at Porto-Ferrara; the island del Giglio; on the shores of Calabugnello, la Follonica, &c.

No less than 1,8 plates embellish this work, in which the shells are represented both of their natural size and magnified.

A number of minute, or microscopic, shells, discovered by the late Mr. Adams, on the coast of Pembroke, are described by that ingenious collector in the third and fifth volume of the Transactions of the Linnean Society, in which will also be found two plates, containing figures of the shells described.

Among the "Observations sur les Coquilles," inserted in "the Journ. d'Hift. Nat." for 1792, and in the "Pro-
drome d'une nouvelle Classification des Coquilles," Mem. Soc. d'Hift. Nat. An. 7, the curious reader will find much more information matter relative to the tectaceal systems of Linnæus, and Bruguiere, and also a sketch of that proposed by their author, M. Lamarck. These were the prelude to his more important undertaking "Système des Animaux fans Vertebres," in which we meet with a new arrangement of tectaceal more comprehensive and satisfactory than has perhaps hitherto appeared upon this interesting subject.

The "Téfasea Microcoepica attentu ex Gen-
eribus Argonauta et Nautilus ad Naturum picta et descrinpt," published at Vienna in 1798, is the joint produc-
tion of L.A. Fichtell and J. P. C. Moll. It treats prin-
cipally on the minute shells of the argonauta and muninis genera, and contains, besides the deformations in the Latin and German languages, accurate figures of a great number of species, among which many that escaped the observa-
tions of Plancius, and every other writer.

Mr. Hutchinson's new and enlarged edition of the "History

of Dorsetshire," includes a catalogue of the birds, shells, and more rare plants of that county, by Dr. Pul-
ney. The tectaceal part of this catalogue is that which interests us in the present detail. Dr. Pulney be-
flowed considerable attention on this department; his re-
marks on the Linnean genera, which the limits of his views permitted him to notice, are judicious; the species he describes are, however, lets numerous than might be expected, nor can we refrain adding, with due respect to the memory of that zealous and well informed naturalist, that all the shells described as species, are not defined in a clear and sat-
 satisfactory manner. As a local catalogue we admit its gen-
eral utility with this exception.

The above mentioned catalogue was printed in 1799, and in the Philosophical Transactions for the same year, ap-
peared Mr. Hatchett's "Experiments on Shell and Bone," in which that accurate chemist relates the particulars of his discoveries resulting from analysis of the component parts of tectaceus and crustaceus substances, in the first of which he de-
tected the presence of phosphate of lime, and he found the other to contain only of the carbonate of lime mixed with glistening matter. The publication of Donovan's "Na-
tural History of British Shells," commenced early in 1799.

This work was designed to include all the species hitherto discovered in Great Britain, systematically arranged in the Linnean manner, with scientific and general observations on each. Five volumes have since appeared in a progressive course of publication, comprising altogether 180 plates, with many coloured figures. The writer of this article does not feel at liberty to comment further on a work which he has himself submitted with deference to public opinion.

It is allowed by Dr. Maton and Mr. Rickett, in their re-
view of tectaceal writings, infested in the Linnean Transac-
tions, "that the author has given several new spe-
cies, and that he has rectified many errors of preceding writers."

The fifth or last volume of Mr. Drwayer's "Bibliotheca

Hist. Nat. Bruskenia," was published in 1827. This is an account of the books on the subject of natural history, in the valuable library of Sir Joseph Banks, and although only a catalogue, will be found to contain much gen-
eral information. In the "Elenchus S. Clionum," we are

prefixed with a methodical arrangement of the principa-
l tectaceal subjects treated of by different writers, nec-
ated in the other part of the catalogue; and which, in many respects, may prove more acceptable as a mode of reference than a catalogue confining merely of the titles of the books and names of the authors.

A paper describing the hinges of some British shells of the bivalve tribe, by Mr. W. Wood, is inserted in the

sixth volume of the Linnean Transactions. The attempt

is ingenious, but on a very confined scale, and it presup-
poles, without the flighty countenance of fact, that among the many writers who had previously noticed shells, or even
written pretentiously on them, no one had hitherto paid atten-
tion to their hinges. The paper is illustrated by fix plates of outlines.

In 1823, the "Tectaceae Britannica" of Mr. G. Mont-
agnu, was published in two quarto volumes. The number of shells described in this work is considerable, as it com-
prehends an account of the microscopic kinds, in addition to those of a larger size. It is embellished with sixteen coloured plates.

"The Historical Account of Tectaceal Writers," to

which, in the course of our foregoing observations, we have had frequent occasion to advert, appeared in the sixth volume of the Linnean Transactions, published in 1824, and is the joint production of Dr. W. G. Maton, and the Rev. Thomas Rackett.

The "Tableau Methodique des Mollusques," by La-
turcle, published in the twenty-fourth volume of the "Nou-
veau Dictionnaire d'Histoire Naturelle," printed at Paris in 1824, affords us an arrangement of shells, founded on that of Lamarck, with some additions that may render it more applicable to general use.

The rise, progress, and general traits of the history of

this science may be more readily collected, we apprehend, in the course of the foregoing review of the different works that have appeared on the subject, than from any other mode that might be devised; and, under this idea, we have adhered as nearly as possible to the chronological order of arrangement, this being the most likely to facilitate the purpose intended. From the perusal of this, the reader will at once perceive which are the most considerable and valuable works on the subject, as well as obtain a general knowledge of a number of treatises, tracts, and memoirs, on particu-
lar articles connected with tectacology, which, being dif-
pered through a variety of miscellaneous and voluminous publications, might, without such reference, escape at-
tention. The leading features, or design, of the respective performances, are likewise detailed, and the embellishments which accompany them pointed out; and, in fact, every other particular deemed likely to assist the student in his choice of the best books in forming a tectaceal li-

brary.

In resuming this subject, as we propose under the ar-
ticle TECTACEOLOGY, we shall be prepared to offer some further, and more general remarks on this topic, and in particular to submit our own ideas as to an enlarged and improved arrangement for the classification of tectaceous shells.
bodies, founded on the leading principles of the best authors, with such amendments as we conceive necessary. D.

Miscellaneous Additions relative to Conchology.

The following instructions for collecting, cleaning, and preparing shells, may not be unacceptable.

The teleosts, like all other animals, have their particular results; some inhabit only the deep parts of the sea, and are what the old writers distinguished by the name of pelagian shells; others are as constantly found in shallow water, in bays, or those parts of the sea which are contiguous to the entrance of rivers: it has also been observed, that many fine and rare shells are sometimes found in the straits between islands, and in shallow near the coast, of four or five fathom water. Some species also are found on rocky, and others on sandy shores. The best shells are those taken alive out of the sea, from whence they may be obtained by means of a trawling-net, such as the fishermen employ, if the depths are not too great; they are also brought up by the cable in weighing anchor, the log-line in foundling, and various other means. Sometimes valuable marine shells are found sticking to the bottoms of ships, or the sides of rocks.

After a storm, good shells may be picked up on the sea beach or flake, as the violent agitation of the water in a tempest separates them from their native beds, and often calls them ashore. But such as have lain exposed for some time to the heat of the sun, or beaten by the waves, are of little value, as their colours will be found faded, and the shells worn and broken; those only are worth selecting from the sea-shore, which have the animal alive within, or which have been recently thrown up.

River shells are, in general, of an obscure colour, and remarkably thin and brittle, in utmost that some have imagined it a peculiar character, by means of which they may be distinguished from the marine or terrestrial kinds. This is not, however, an absolute criterion, for many of the latter are as thin as the river shells, as we observe, for example, in the argonaut, or paper nautilus, some pinnae, and many other sea shells, and in numbers of the shells of the terrestrial kind.

Terrestrial, or land shells, though few in comparison with the former, are oftentimes very beautiful, and not less esteemed than the marine kinds. Those are found most commonly crawling, like the snail tribe, on various sorts of plants, and in warm countries especially abundant.

Many shells possess such a smooth, and highly polished surface, and are so beautiful in colour when they are filled up, that art cannot improve their appearance, such as for instance, the cyprea or cowry, and the voluta or varole, with many others. It is the commonly received opinion, that the animal, inhabiting all naturally polished shells whatever, are capable of not only adding to the extent and growth of their shells, but that they are able, from time to time, as occasion may require, to add a fresh polished covering to the whole shell. Should this opinion be unfounded, they can at least extend their organs to such a length, as to clean away all impurities from their shells, as we learn from many cows and tortoises, or any extraneous bodies, adhering to any part of them.

Other shells are covered with an epidermis or membrane, intended with no doubt by nature to defend them from accident, and aid their growth. The structure of this epidermis varies very much, being in some laminted, in others fibrous or brush-like, or pilous, and velvetty. The epidermis prevents the leprous, and other similar shells, or marine worms, from fixing their habitations on them; it is worthy of remark, that most shells, with a leprous surface, are covered with an epidermis. Many others, when taken out of the sea, are limy, and encrusted with lime, coraline, and other extraneous matter.

Immediately after gathering or collecting the shells, and these especially taken from the sea, the first process necessary, is to destroy and extract the animal inhabitant, without injuring the shell, and then to prepare the shell, that it may not be damaged by the action of the marine salts, with which they are saturated. As shells are of a calcareous nature, all acids should be as much avoided as possible, both in killing the animal, and preparing the shell; it is usual to boil them in water for this purpose, but as boiling may injure the shells, it will be most advisable to dip them into boiling water, which will be sufficient to kill the animal, after which, let them remain for two or three minutes to cool, and then put them into cold water, in which they may lie till they are taken out to be cleaned. The animal, by being killed in this manner, becomes condensed, and somewhat solid, and may be picked out by any sharp instrument.

Shells encrusted with extraneous matter should be allowed to steep for some time in warm water, both for the sake of melting these substances, and to extract as much as possible the marine salts. They may be suffered to remain in water two or three minutes without any injury. After this brush them well, observing only that the brush must not be too hard. If that proves insufficient to clean them, rub or brush them again with tripoli or emery, or put them into weak acid for the space of a minute and then dip them into cold water, which process may be repeated as often as will be necessary to remove the extraneous matter. Strong soap may also be used with a rag of woollen or linen cloth to rub them, or a key of pearlash and when cleaned finish them with a soft brush and fine emery.

Scientific collectors endeavour to preserve one at least of every shell with the epidermis on, to exhibit its natural appearance, together with the uncoated specimens.

The epidermis may sometimes be so thick that it will be necessary to take it off before the shell can be pointed. For this purpose pour a quantity of the spirits of nitre, or nitrous acid, into water, in the proportion of about one-fifth or one-tenth part of the former; put this into a shallow basin or saucer, and place the shell or shells therein, in such a manner that the corrosive fluid may act only on the coat, without injuring the orifice or mouth, which in some cases may be coated with beeswax; change the situation of the shell every two or three minutes, that all the parts may be equally uncoated; wipe off the bubbles as occasion may require with a feather, first dipped in water, when you perceive the enamel in any part free from the coat, take it out, and wash off the aquafortis, and after this proceed rub them with fine emery powder. If instead of a thick epidermis it is only a pellicle, it is sufficient to steep it in hot water, and then pick it off; or steep the shell in vinegar till it peels off freely, or is corroded away. The epidermis of some shells is so coarse and thick as to require the corrosive quality of acids diluted, or even of aquafortis; emery with strong brushes is then substituted, or flesh-flour, and pumice stone, or the exterior coat may be ground off with a grindstone, or files of various dimensions. If the matter is too obtuse to be cleared off by this means, pour some spirit of nitre into a cup or other vessel, upon the part
part of the shell that may be susceptible of injury with soft wax, as carefully as possible, and put it into the liquor in the vessel; remove it every minute into cold water, but observe never to first it into the same water more than once, and wash it every time before you return it into the corrosive liquor. If the shell is warped, irregular, or armed with points, examine it with a common magnifier; and if you perceive on the more prominent parts through the wax any appearance of the polished surface, cover them with wax, and let the shell remain a few minutes longer in the spirit, take it out and wash it again; after which, polish the shell with fine emery, and pulp a camel’s-hair pencil with gum arabic over them to brighten the colours; the white of egg is sometimes used, but it is very apt to turn yellow in time, though at first it appears glairing; and varnish communicates a disagreeable smell.

Some shells have naturally a slight polish; those may be rubbed by the hand with chamois leathers, which will give them a bright glossy appearance; avoid when possible the use of emery powder, as it is apt to detriment the beautiful workings on the shells; it cannot however be often left out of use.

It is desirable as far as can be to point out the impressions which are often practised on those who are not well acquainted with shells, and are therefore not aware that any individual shell may be made to assume a very different appearance by having the first or second exterior coat of the shell removed by acids, or any other means. Thus, for example, we see that though the outer surface of the common cowry, or tile shell, is of a pale colour, with dark spots; when that is cleared off, it is of a fine violet colour: the sea ears are clouded with brown, green, and white; but when that coat is rubbed away it appears of a beautiful pearl colour. Thus also the nautilus shell is externally of a pale brown or ochreous hue, variegated with streaks of cheetah, but on the exterior coating being taken off, the whole shell will be found of that luscious known by the familiar name of mother of pearl. The same circumstance is observed of the true mother of pearl shell, the exterior coat of which is blackish; many of the trochis, or top shells, and an infinite variety of other shells of different genera are of the same description. Among these shells which alter their appearance most, we must not omit the volute, called by us the purple or violet tip, and by the French epaule; it has a brown epidermis which, being taken off, discovers the ground colour to be a dull yellow. When this is worked down to beneath the crust or surface, it is of a pure white, with the tip of a fine violet. We shall lovingly mention the common murex: the exterior coat of which is dull blueish black, that beneath purple, and the inner one white: sometimes we have seen muscles in the hands of dealers, and in scientific collections, of a fine purple colour, variegated with large distinct spots of white or brown, so dexterously managed as to have all the appearance of a shell in a natural state, though in reality such shells are the work of art, and no other than the common edible musles. For this purpose those of the largest size are usually selected, which, being first ascended down to the brightest purple surface, are afterwards fretted or rubbed with a file, in particular parts, till the white or inner coating is seen through the purple. The spots may be managed however with more certainty, by covering the whole surface with a thin coat of wax, then ferapring off the wax in such parts as it is designed should exhibit spots, and hastily suffuring the shell to remain in spirit of salts diluted, or nitrous acid, till the outside is corroded in those parts down to the white or inner coat of the shell. After washing the shell, and clearing off the wax, the spots thus formed may be flained of any colour, according to the fancy of the operator. A preparation of the oxyd of iron, or manganese, are most commonly employed, as these produce a brown colour of different tints, and form an indestructible film. The Dutch, who are great amateurs in conchology, paint shells with a variety of colours, and to that ingenuity, as to render it difficult to detect the imitation. Neither are they less expert in joining broken shells, cementing and filling up holes pierced by marine worms, or fractures, and filling the mouths and tips in such a manner as to entirely alter their appearance.

Fossil shells should be noticed here if any instructions were necessary for their preservation; but these in general constitute the most durable part of a collection, being either chalky, casts in flint or stone, or replacements of party matter, with perhaps only some light fragments of the shell adhering, and that very rarely. They are dug out of chalk-pits, lime-flour, or other flint-quantities, and coal-pits, &c. Vide "Donovan's Instructions for collecting and preserving Subjects of Nat. Hist." from which the above particulars are chiefly extracted.

CONCHUCOS, in Geography, a jurisdiction of South America, in the vice-royalty of Peru, subject to the archbishop of Lima, which commences 40 leagues N. N. E. of Lima, and extends along the centre of the Cordilleras. Its air, therefore, is different according to the height of the situation of its several parts, the mildness of which produce all kinds of grains and fruits, and the others, where cold checks their fertility, afford pasture for all kinds of cattle. This jurisdiction abounds with looms: the principal occupation of the Indians being woolen manufactures of various kinds, which constitute the greatest part of its commerce with other provinces.

CONCIATOR, in the Glass Art, is for the crystal glads what the founder is at the green glads houses. He is the perfon that weighs and proportions the salt on ashes and sand, and works them with a strong fire, till they run into lumps, and become white; and if the metal be too hard, and conquitently brittle, he adds fat, or ashes; and if too soft, sand; still mixing them to a fit temper, which is only known by the working.

CONCILIO—Quaera corum rege et Concilio. See Queerta.

CONCINNA, DANIEL, in Biography, an Italian Dominican, born in the Venetian territory about the year 1696. He was highly distinguished for his pupit talents, which attached to him numerous admirers in Italy, and even in Rome itself. As a writer he was esteemed, on account of the support which he gave to the inftitutions of the Papal church. He was author of numerous publications in the Latin and Italian languages, on historical, moral, and critical subjects, among which are "Defenso Concili Trientini, et Apoll. Cons. Eccle. Rom. in causa Papauratis Monatli. &c.," "Utra Contractu trini Differuntissimus Hitt. Theol. demonstrat.," &c. "De Spectaculis Theatrabus Christiano Exequisu, tum Laico, tum Clerico, vetatis, &c.," "Theologiae Chiristiana, dogm atico-moralis," in 12 vols. 4to. "The logical, Moral, and Critical Differenlates, relative to the Logic of Probabilities, with Supplementary Observations." "A Defence of Revealed Religion, &c." He died at Venice in the year 1756. Nov. Hist. Diet.

CONCINNOUS Intervals, in Music, are such as are apt and of use in harmony, as the V. 4th. III. 5th, 6th, IV. and 5th. in contradistinction to such as are inconceivable, as the intervals deficient or redundant by a comma. See Comma-Redundant, Fifth, Fourth, &c.
CONCINO CONCINI, MARSHAL D'ANCRE, in Biography, was a native of Tuscany, and, with his wife, Leonora Galgai, accompanied Mary de Medicis, queen of Henry IV. into France, in 1660. He was made gentleman of the bed-chamber, governor of Normandy, and marshal of France, in 1615. As he was raised by the influence which he attained over the mind of the queen, he held the reins of government during the minority of Louis XIII., and behaved so haughtily a manner to the young king, that he was induced to order his arrest, and, in case of resistance, the person sent on the business was commanded to kill him. The captain of the guard demanded his favor as he was passing the drawbridge of the Louvre, and upon his refusing to comply, he shot him dead, April 24, 1617. His body, after it had been buried, was taken up and given to the populace, who treated it with every indignity. His wife was afterwards condemned, by a decree of the parliament, to be hanged and burnt. Moreri.

CONCIOLO, an Italian painter, who flourished in the commencement of the thirteenth century. Upon a picture at Subiaco, in the Ecclesiastical State, representing the consecration of a church, the artist has thus signed his name, Conciolus pinxit, 1219. This is one amongst the many proofs, with which the churches and convents of Italy abound, to shew that however low the state of the arts in Europe, previous to Cimabue and Giotto, the intervention of Greek painters was by no means necessary to their establishment. Lanzi. Storia Pittorica.

CONCIONATORES, in Antiquity, common-councilmen, freemen, called to the hall or assembly, as most worthy. Thus, "quodam tempore cum convenienent concionatores apud London, &c." Hist. Elen. apud Gale, c. 49.

CONCLAMATTO, a shout raised by those present at burning the dead, before they set fire to the funeral pile. See Sicut. The word was also applied to the signal given to the Roman soldiers to decamp, whence the expression "conclamare vasa," and "conclamari arma," was a signal for battle. It was likewise used for a practice of calling to a person deceased three times by his name, and when no reply was returned, they thus expressed his decease, "conclamatum est." Whence the same term was afterwards applied to the ejection of the Roman empire.

CONCLAMATO, among the Greeks, Romans, and several other nations, was a spontaneous cry or shout, which all the soldiers of an army made when they understood or heard the third signal for combat.

CONCLAVE, an assembly or meeting of all the cardinals that are at Rome, shut up for the election of a pope; whence it derives its name. See Cardinal.

The conclave had its rise in the year 1270, and on this occasion: Clement IV. being dead at Viterbo, in 1268, the cardinals were nearly three years old, viz. from the 29th of November 1269, to the 1st of September 1271, without being able to agree on the election of a successor; in effect, things were carried to such a pass that they were upon the point of breaking up, without coming to any conclusion at all.

The cardinals, being apprized of their design, by the advice of St. Bonaventure, then at Viterbo, shut the gates of their city, and locked up the cardinals in the pontifical palace adjoining to the cathedral, till they were brought to a better understanding.

Hence arose the custom, which has since prevailed, of shutting up the cardinals in a single palace, till they have elected the pope.

Such was the origin of the conclave, as related by Onuph. Panvinio, Cimabue, and Papebroch.

Pavilion informs us, that John of Toledo, cardinal bishop of Paffo, seeing the cardinals daily praying the Holy Ghost to inspire them with the spirit of concord and union, and yet difcord continuing to reign among them, said pleasantly, "Let us uncover the room, else the Holy Ghost will never get at us." When this facetious remark was reported to the magistrates of Viterbo, they immediately ordered the roof of the room in which the cardinals were assembled, to be taken off, hoping that this new inconvenience would oblige them to hold the election; but their obstinacy prevailed against all inconveniences, till the magistrates betook themselves of daily affronting their subordinates; and this had the desired effect. For being thus reduced to the alternative of starving or agreeing, they left the election by compromise to fix of their number; and then Gregory X. was elected.

Conclave is also used for the place wherein the election of the pope is performed; which is now at St. Peter's in the Vatican; though Gregory X. and Clement V. appointed it should always be held in the place where the last pope should die. But if he should die in a borough or village, where the electors could not conveniently meet, the election was to take place in the episcopal city, or in the nearest to it, if that city were under an interdict.

While the affair is in hand, if it be in winter, the walls and windows are all mured up, excepting only a single pane, to give a little light; in summer the windows are not closed; but the great door of the hall is secured with four locks and four bolts; an aperture being, however, left, through which to supply the imprisoned prelates with victuals.

If the election takes place at Rome, the door of the conclave, and all the avenues to it are to be carefully guarded by the city guards, by the Roman nobility, by the ambassadors of princes, and by the bishops and conservators of the city. If the election is to be made out of Rome, the same duty is incumbent upon the temporal lords and magistrates of the place; and it is a duty common to them all to see that nothing be carried into the conclave, or out of it, that has the least tendency to retard or prevent a lawful election.

In the hall, which is very ample, there are cells or flails erected for as many cardinals as are to be present at the election; the cells being only separated by deal boards, and the room having no outlet, except to the privy.

The cells are marked with letters of the alphabet, and are distributed to the cardinals by lot: each cardinal puts his arms on the cell that falls to his share.

No one shall be allowed to go into the common room or conclave, nor out of it, but in case of sickness, or on some other urgent occasion.

After the assembly has continued three days, they are only allowed one dish for a meal; and after fifteen days more, only bread, wine, and water, though this rule is not very strictly regarded.

Each cardinal is allowed two conclavists, or servants to attend him, and to be shut up with him.

The election is begun ten days after the pope's decease, and decided by a majority of two parts in three of the cardinals present, who vote by ballot; and if, upon the fourth, no one of the candidates has two-thirds of the votes, the balloting must, after a fazed interval, be repeated. And this continues to be reiterated, if they should remain shut up for years, till one of them attains the fore-mentioned superiority. Cardinals who arrive before the election is finished, are included with the rest.

These regulations were principally established by Gregory X. in 1-74. But as this conclusion of Gregory X.
was thought by the cardinals to be too rigorous, they prevailed upon Clement VI. in the year 1351, not long before his death, to mitigate it. Clement allowed them to have each two servants, clerks, or laymen; to have curtains round their beds, and one dish of fish or fish at dinner, and another at supper, besides bread, wine, fruit, and sweetmeats, so long as they continued in the conclave.

Matthew Paris says, the word conclave actually signified the pope's wardrobe.

It is a popular proverb in Italy, _chi entra papa, e scappa cardinal_; he who enters pope, comes out cardinal; q. d. he who according to common report will be elected pope, ordinarily is not.

We have various accounts, both by papist and popish writers, of the intrigues that have been practised in the conclave, during contested elections. What is said to have passed upon the decease of Alexander VII. is no tale invented by papists, but related by grave Roman catholics, viz. that on the day following, cardinal Sforza, going into the conclave, asked another cardinal, his intimate friend, what he thought would be the issue? He returned this frank answer: "Signior cardinal, if the French make the pope, he will be cardinal Farnese; if the Spaniards, cardinal Rospigliosi; if he is made by the people of Rome, he will be cardinal Barberini; if the Holy Ghost appoints him, cardinal Odescalchi will be the man; if the devil has a hand in it, he must be your eminence, or myself." Upon this, Sforza replied with a laugh, "then Rospigliosi will be the man," and he was accordingly chosen by the name of Clement IX. In the year 1724, upon the death of Innocent XIII, the following farcical distinction was made between the candidates for the papal throne:

"Il Ciolo vuol Orfini
Le popolo Corfini
Le Donne Ottoboni
Il Diavolo Alberoni."

_Le S. "Heaven is for Orfini,
The people for Corfini,
The ladies for Ottoboni,
The devil for Alberoni._

But Orfini was chosen by the name of Benedict XIII.

**CONCLUSION.**

**Keyser's Trav. vol. ii. p. 109.**

**CONCLUSION.** In _Law_, is a man by his own act upon record hath charged himself with a duty or other thing, or confessed any matter whereby he shali be concluded: as if a sheriff returns that he hath taken the body upon a capias, and hath not the body in court, at the day of the return of the writ; by the return, the sheriff is concluded from plea of escape, &c. Terms de Ley, 152, &c. In another sense the word conclusion signifies the end of any plea, replication, &c. and a plea to the writ, is to conclude to the writ; a plea in bar, to conclude to the action, &c. Conclusion of plea in bar shall be, et loco paratus est verificare—of other pleas et de loco ponit se super prationem. Kitche. 219, 220. See _Plea._

**CONCLUSION of deeds,** mentions the execution and date of the deed, or the time of its being given or executed, either expressly, or by reference to some day and year before-mentioned. Not but a deed is good, although it mention no date, or hath a false date; or even if it hath an impossible date, as the 50th of February; provided the real day of its being dated or given, that is delivered, can be proved.

**CONCLUSION.** In _Logic_, the last part of an argument; or the consequent drawn from something either assumed or proved before.

The conclusion of an argument contains two parts: the consequent, which is the matter of it; and the consequence, which is its form, and which, of a simple absolute proposition, renders the conclusion relative to the premises whence it is drawn.

The question and conclusion, say the schoolmen, are the same ideas, only confidered in different views, or relations: in the question they are considered as doubtful; in the conclusion as void of doubt.

**CONCLUSION.** In _Oratory_, consists of two parts: the recapitulation, or enumeration, and the _Passions._ See _also Peroration._

**CONCLUSIONS D'UNE procedure militaire,** Fr. See the article _JUDGE ADVOCATE._

**CONCOBAR,** in _Ancient Geography_, a town of Asia, in Upper Media, towards the S.W. of Ecbatana.

**CONCOCTION,** in the _Animal Economy_, a term used by the older writers to denote the processes which the food undergoes in the stomatch, and by which it is converted into chyme and chyle. The process is now more usually termed _Diggestion,_ which see.

**CONCOCTION,** in the _Pathology_ of Hippocrates and Galen, and their numerous followers, was also employed to signify certain changes in the fluids in the course of acute diseases, from a supposed analogy between the changes, and those which the aliment undergo in the stomatch during digestion. The process of concoction may be particularly illustrated in the case of a common phlegmon, or boil: the progress of which is marked, according to Galen, by four distinct stages. The first, or _incipient stage_, in which these fluids are beginning to collect, is considered as the stage of crude and unchanged humours: in the second, or stage of _increa_ , in consequence of the progress of concoction, heat is diffused through the part, and the pain, tension, and tumour are increased: when the humours are completely concocted, and converted into _pus_, the stage of the phlegmon is laid to be _stationary_, or the disease to be in its vigour: and the fourth stage is that, in which the tension and tumour become less, and which is termed the _decline_ of the ewelling. A similar progress is observable in almost all inflammatory diseases.

Thus in catarrh, afflicting the mucous membrane of the nose, the discharge in the commencement is thin and watery, and, in the language of the humoral pathology, _crude_; by degrees a thicker and more opaque matter is discharged, which, at length (becoming completely concocted), assumes a very thick and purulent appearance, which betokens the decline of the disease. Such also is the progress of change in the fluids excreted in inflammations of the lungs and bronchiae, discharged from the eyes in ophthalmia, &c. By an analogy somewhat remote, this doctrine was transferred to febrile complaints, where no local inflammation, or depositary of morbid concocting matter, existed. In an idiopathic fever, as syphusus or typhus, the alvine excrements, the urine, and the discharge from the skin, were referred to, as evidence of the process of concoction; and the varieties of the appearance of these discharges are described by Hippocrates, and his commentator Galen, as denoting the states of crudity and of concoction, and hence as affording a prognosis of the future progress and event of the disease. The alvine excrement is laid to be well concocted, when it is, as in health, soft and connected, and is discharged with the usual regularity. When it is not in this state, but liquid and watery, partly liquid, partly
partly solid, &c, it is considered as not concocted, and therefore indicating the unhealthy condition of the bowels, through which it had passed. And thus, with respect to the urine, when it is extremely thin and alkaline, it is said to be crude; and when it is slightly tinged with yellow, it is considered as having undergone a small degree of concoction, which is still more complete, if it soon depairs a moderate sediment. But the signs of concoction in the urine were said to be different in the young and the old, and different also in different dis- eases. Thus in bilious and summer fevers, a light cloud suspended in the urine was deemed the sign of concoction; in inflammatory fevers, a white sediment. See Galen, de Tot. Morb. Tempor. et de Cirrhis, lib. i.

CONCOLIN, in Geography, a town of France, in the department of the Ille; 43 leagues N.E. of Grenoble.

CONCOMITANT, in Theology, something that accom- panies, or goes along with, another.

Concomitant grace, is that which God affords us during the course of our actions to enable us to perform them; and as the Roman schoolmen say, to render them meritorious.

Concomitant necessity. See Necessity.

Concord, Form of, in Ecclesiastical History, a stand- ard-book among the Lutherans, composed at Torgau, in 1576, and thence called the Book of Torgau, and reviewed at Berg, by six Lutheran doctors of Germany, the principal of whom was James Andrea. This book contains in two parts, a synoptical history of the subscription of which was a condition of communion, and a formal and very severe condemnation of all who differed from the compilers of it, particularly with respect to the majesty and omnipotence of Christ's body, and the real manifestation of his flesh and blood in the eucharist. It was first imposed on the Saxons by Augu- gustus, and occasioned great opposition and disturbance, both among the Lutherans and Reformers.

Several of the most eminent churches of the Lutheran communion rejected it so firmly and reluctantly, that no arguments nor inter- ries could engage them to admit it as a rule of faith, or even as a mean of instruction. Accordingly, it was rejected for various reasons, by the churches of Hesse, Pom- erania, Nuremberg, Holstein, Silesia, Denmark, Brunswick, and others. Among the Reformed, or Calvinists, the Swiss doctors, at the head of whom was Hofmianus, the Bel- gian divines, those of the Palatinate, together with the prin- cipalities of Anhalt and Bade, declared war against it. This form of concord, however, was patronized in a special manner by Julius, duke of Brunswick, to whom, in a great measure, it owed its existence; and who employed his authority and influence in encouraging those by whom it was composed, and in commanding all the ecclesiastics, within his dominions, to receive and subscribe it as a rule of faith. But soon after it was published, this zealous prince changed his mind, suffered it to be publicly expounded by the divines of his university of Helmuid, and to be excluded from the number of creeds and confessions that were received by his subjects. Various means were used to obviate his objections; and particularly in the year 1583, a convocation of divines from Saxony, Brandenburg, Brunswick, and the Palatinate, was held at Quedlinburg for this purpose. But Julius perilled in his opposition, and professed that the form of concord should be examined, and its authority disallowed by a general assembly or synod of the Lutheran church.

In the year 1614, John Sigismund, elector of Branden- burg, following the example of the landgrave of Hesse, renounced Lutheranism, and, under certain restrictions, embraced the communion of the Reformed churches. This event occasioned a dispute, which was agitated with violence, and which occasioned the form of concord to be suppressed in the territories of Brandenburg, and the subjects of that electorate to be prohibited, by a solemn edict, from studying or defending it in the country of Walfenburg. Towards the close of the 17th century, viz. in the year 1675, a new contentious of faith was drawn up by the Helvetic divines, under the denomination of the "form of concord or of agreement," and which was reissued, the "Confession of Faith;" but the introduction of it occasioned contentions and tumults in several places. It maintained, however, its credit and authority in the church of Geneva, until the year 1728, when, without being abrogated by any positive act, it fell into disuse. In several other parts of Switzerland, it was still imposed as a rule of faith, particularly in 1718, by the magistrates of Bern, who published an order, by which all preachers and pastors, particularly those of the university and church of Lausanne, who were suspected of entertaining any erroneous opinions, were obliged to declare their adherence to this formulary. Many pastors and candidates for holy orders refused the omen that was demanded by the magistrates, and some of them were punished for this refusal. In consequence of these warm contending and previous complaints letters were addressed by George I. king of England, as also by the king of Prussia, in the year 1723, to the Swiss cantons, in order to procure the abrogation of this form, or confession, which was considered as an obstacle to the union of the Reformed and Lutheran churches. Mo- lembach. See Necessity.

Concord, a town of America in the state of Vermont and county of Essex, lying on the Connecticut river, opposite to a point of the 15 mile falls.
Concord, or usually that for in •« and t from the spot where the first opposition was made to the British troops, on the 19th of April 1775. The grand court has been held here, when contagious diseases have prevailed in the capital. N. lat. 4° 25'. Concord, a small river of Massachusetts, formed of two branches, which unite near the centre of the town of Concord, whence it takes its course in a N.E. and N. direction through Bedford and Billerica, and empties itself into Merrimack river at Tewfickbury. This river is remarkable for the abundance of fish that swim in its current. At low water mark it is from 100 to 200 feet wide, and from 6 to 12 feet deep. During floods it is nearly a mile in breadth: and when viewed from the town of Concord, exhibits a fine appearance.

Concord, a township of Delaware county in the State of Pennsylvania.

Concord, a settlement in Georgia, on the E. bank of the Mississippi, about a mile from the fourth line of Tennessee, 128 miles N. from the mouth of Yazoo river, and 218 below the Ohio. N. lat. 35° 55'. W. long. 91° 25'.

Concord, in Grammar, that part of syntax, or construction, whereby the words of a sentence agree among themselves, i.e. whereby nouns are put in the same cafe, number, gender, &c. and verbs in the same number and person, with nouns and pronouns. The rules of concord are generally the same in all languages, as being of the nature of what is use almost everywhere, for the better distinguishing of discourse.

Thus, the distinction of the two numbers singular and plural obliges us to make the adjective agree with the substantive in number, that is, to put the one either in this or that number, according as the other is for the substantive being the thing confusedly, though directly, marked by the adjective; if the substantive word mark several, there are several subjects of the form marked by the adjective, and of consequence this should be in the plural; as bonînes doûti, &c.

Again, the distinction of masculine, and feminine, renders it necessary to put the substantive and adjective in the same degree.

And verbs should have concord or agreement with nouns and pronouns in number and person.

If any thing occur apparently contrary to these rules, it is by a figure; i.e. something is implied, or the ideas are considered more than the words themselves. See Syntax.

Concord, Order of, in Heraldry, was instituted by Christian Ernelt, Margrave of Brandenburgh, on his return from Spain, in the year 1666, to distinguish the part he had taken in restoring peace and union to many European princes. The badge of the order is a gold crown of eight points enamelled white, surmounted by an ecclesiastical crown; in the centre of the cross a medal thereon, two olive branches paling fatterwise through two crowns; around the medal the motto concordamus. On the reverse the founder's cypher with the date of the institution. This badge is worn pendant from an orange ribbon.

Concord, in Law, is the agreement between parties who intend the levying a fine of lands to one another, how and in what manner it shall pass. This is usually an acknowledgment from the deforciants (or those who keep the other out of possifion) that the lands in question are the right of the complainant. And from this acknowledgment or recognition of right, the party levying the fine is called the cognisant, and he to whom it is levied the cognisant.
of numbers; we know what it is pleases us, though we do not know why: we know, o. gr., that the ratio of 1:2 constitutes concord, and 6:7 discord; but on what original grounds agreeable or disagreeable ideas are connected with those relations, and the proper influence of the one on the other, are above our reach.

By experiment we know, that the following ratios of the lengths of strings are all concord; viz. 2:1, 3:2, 4:3, 5:4, 6:5, 7:5; that is, take any string for a fundamental, which shall be represented by the number 1, and the following divisors thereof will be all concord with the whole; viz. 2:1 1.5:1 3:2 2:1.

So that the distinguishing character between concords and discords must be looked for in the numbers, expressing the intervals of sound, and not in the intervals themselves, but as expressing the number of vibrations. Now, unisons are in the first degree of concord, or they have the most perfect likeness or agreement in tone; and therefore have something in them accessory to that agreement which is found, less or more, in every concord: the nearer two sounds come to an equality of tone, the flower are the beats, and the more agreement they have; therefore, it is not in the equality or inequality of the numbers that this agreement lies.

Further, if we consider the number of vibrations made in any given time by two strings of equal tone; on the principle laid down, they are equal: and therefore the vibrations of the two strings coincide, or commence together as frequently as possible, i.e., they coincide at every vibration; in the frequency of which coincidence, or united mixture of the motions of the two strings, and of the undulations of the air which they occasion, it is, that the difference of concord and discord must be sought. Now, the nearer the vibrations of two strings approach to a coincidence as frequent as possible, the nearer they should approach that condition, and consequently the agreement of unisons which is confirmed by experience.

For if we take the natural series 1, 2, 3, 4, 5, 6, and compare each number to the next, as expressing the number of vibrations in the same time of two strings, whose lengths are reciprocally as those numbers; the rule will be found exact, for 1:2 is best, then 2:3; after 6 the union is unfavourable; the coincidences being too rare: though there are other ratios that are agreeable, besides those found in that continued order, viz. 3:5, and 5:8, which, with the preceding five, are all the concordant intervals within, or less than an octave, or 1:2; that is, whose acutest term is greater than half the fundamental.

On this principle, 2:3 will be preferable to 4:5; because those being equal in the number of vibrations of the acuter term, there is an advantage on the side of the fundamental in the ratio 2:3, where the coincidence is made at every third vibration of the fundamental, and every fifth of the acuter term, but the ratio 4:5 is less perfect than 2:3; because, though the vibrations of each fundamental that go to one coincidence are equal; yet in the ratio 4:5 the coincidence is at every sixth of the acuter term, and only at every eighth in the other case.

Thus, we have a rule for judging of the preference of concords, from the coincidence of their vibrations: agreeable to which rule, they are disposed into the order of the following table; to which the names of the concords in practice, the ratio of their vibrations, the lengths of the strings, and the number of coincidences in the same, are expressed.

<table>
<thead>
<tr>
<th>Ratios, or vibrations.</th>
<th>Grave Acute</th>
</tr>
</thead>
<tbody>
<tr>
<td>Term</td>
<td>Term- Term</td>
</tr>
<tr>
<td>---</td>
<td>---</td>
</tr>
<tr>
<td>Unison</td>
<td>1</td>
</tr>
<tr>
<td>Octave, 8ve</td>
<td>2</td>
</tr>
<tr>
<td>Fifth, 5th</td>
<td>3</td>
</tr>
<tr>
<td>Fourth, 4th</td>
<td>4</td>
</tr>
<tr>
<td>Sixth, gr.</td>
<td>5</td>
</tr>
<tr>
<td>Third, gr.</td>
<td>5</td>
</tr>
<tr>
<td>Third, fett</td>
<td>6</td>
</tr>
<tr>
<td>Sixth, fett</td>
<td>8</td>
</tr>
</tbody>
</table>

Though this order be settled by reason, yet it is confirmed by the ear. On this foundation, concords must still be the more perfect, as they have the greatest number of coincidences, with regard to the number of vibrations in both the strings; and where the coincidences are equal, the preference will fall on that interval, whose acutest term has fewest vibrations to each coincidence: which rule, however, is in some cases contrary to experience; and yet it is the only rule hitherto discovered.

Indeed, Kircher, after father Merleau, gives us another standard for settling the comparative perfection of intervals with regard to the agreement of their extremes in tone: and it is this.

The perception of concordance, say they, is nothing but the comparing two or more different motions which in the same time affect the auditory nerve: now we cannot make a certain judgment of any concordance, till the air is as often struck in the same time by two strings, as there are units in each member expressing the ratio of that concord; o. gr. we cannot perceive a fifth, till two vibrations of the one string, and three of the other, are accomplished together; which strings are in length as 5 to 2: the rule then is, that those concords are the most simple and agreeable, which are generated in the least time; and those, on the contrary, the most compound and harsh, which are generated in the longest time.

For instance, let 1, 2, 3, be the lengths of 3 strings, 1:2 is an octave; 2:3 a fifth; and 1:3 an octave and fifth compounded, or a twelfth. The vibrations of strings being reciprocally as their lengths, the string 2 will necessarily vibrate once, while the string 1 vibrate twice, and then exits an octave; but the twelfth does not yet exist, because the string 3 has not vibrated once, nor the string 1 twice, which is necessary to form a twelfth.

Again, for generating a fifth, the string 2 must vibrate thrice, and the string 3 twice; in which time, the string 1 will have vibrated 6 times; and thus the octave will be thrice produced, while the twelfth is only produced twice; the string 2 uniting its vibrations sooner with the string 1, than with the string 3; and they being sooner consonant than the string 1 or 2 with that 3. Whence, that author observes, many of the mysteries of harmony, relating to the performance of harmonious intervals, and their generation, are easily deduced.

But this rule, upon examining it by other instances, Mr. Malcolm has shown defective, as it does not answer in all positions of the intervals with respect to each other; but a certain order, in which they are to be taken, being required: and there being no rule, with respect to the order, that will make this standard answer to experience in every case; so that at last we are left to determine the degrees of concord by experience and the ear.

Not but that the degrees of concord depend much on the more or less frequent uniting the vibrations, and the ear's being
being more or less uniformly moved, as above; for that this mixture or union in motion is the true principle, or, at least, the chief ingredient in concord, is very evident: but because there seems to be something farther in the proportion of the two motions necessary to be known, in order to fix a catholic rule for determining all the degrees of concord, agreeable to sense and experience.

The result of the whole doctrine is summed up in this definition.—Concord is the result of a frequent union, or coincidence of the vibrations of two harmonious bodies, and, by consequence, of the undulating motions of the air, which, being caused by those vibrations, are like and proportionable to them; which coincidence, the more frequent it is, with regard to the number of vibrations of both bodies, performed in the same time, esteris parallelius, the more perfect is that concord: till the rarity of the coincidence, in respect of one or both the motions, produces discord.

See some of the remarkable phenomena of sounds accounted for from this theory, under the word Unison; &c. also Interval, &c.

Mr. Carre, in the Memoirs of the Royal Academy of Sciences, lays down a new general proposition, to determine the proportion which cylinders which have, in order to form the concords or consonances of music. And it is this—that the solid cylinders, whose sounds yield those concords, are in a triplicate and inverse ratio of that of the numbers which express the same concords.

Suppose, e. gr. two cylinders, the diameters of whose bases and lengths are as 3 to 2: it is evident their solidities will be in the ratio of 27 to 8, which is the triplicate ratio of 3 to 2: we say then, that the sounds of those two cylinders will produce a fifth, which is expressed by those numbers; and that the biggest and longest will yield the grave sound, and the smallest the acute one. And the like of others.

Concords are divided into simple, or original, and compound.

A simple, or original concord, is that whose extremes are at a distance less than the sum of any two other concords.

On the contrary, a compound concord is equal to two or more concords.

Other musical writers state the division thus: an octave 1: 2, and all the inferior concords above expressed, are all simple and original concords: and all greater than an octave, are called compound concords; as being composed of, and equal to the sum of one or more octaves, and some simple concords less than an octave; and are usually, in practice, denominated from that simple concord.

As to the composition and relations of the original concords, by applying to them the rules of the addition and subtraction of intervals, they will be divided into simple and compound, according to the first and more general notion; as in the following table:

<table>
<thead>
<tr>
<th>Simple Concord</th>
<th>Compound Concord</th>
</tr>
</thead>
<tbody>
<tr>
<td>5: 5 a 3d leff. 4th</td>
<td>30g. and 3d. 3d. 3d. 3d.</td>
</tr>
<tr>
<td>4: 5 a 3d gr. 6th l.</td>
<td>4th. 3d. 3d. 3d.</td>
</tr>
<tr>
<td>3: 4 a 4th. 5th g.</td>
<td>4th. 3g.</td>
</tr>
</tbody>
</table>

The octave is not only the first concord in point of perfection, the agreement of whose extremes is greatest and the nearest to unison; infomuch that, when founded together, it is impossible to perceive two different sounds; but it is also the greatest interval of the seven original concords; and, as such, it contains all the lesser, which derive their sweetness from it, as they arise more or less directly out of it; and which decrease gradually, from the octave to the lesser sixth, which has but a small degree of concord.

A remarkable circumstance is the manner wherein these minor concords are found in the octave, which shews their mutual dependences.

For, by taking both an harmonical and arithmetical mean between the extremes of the octave, and then both an harmonical and arithmetical mean between each extreme, and the most distant of the two means last found; viz. between the lesser extreme and the first arithmetical mean, and between the greater extreme and the first harmonical mean; we have all the lesser concords.

Thus, if between 360 and 180, the extremes of octave, we take an arithmetical mean, it is 270; and an harmonical mean is 240; then, between 360 the greater extreme, and 240 the harmonical mean, take an arithmetical mean, it is 300; and an harmonical mean is 288. Again, between 180 the lesser extreme of the octave, and 270 the first arithmetical mean, it is 225, and an harmonical one 216.

Thus, we have a series of all the concords, both ascending towards acutenesses from a common fundamental 360; and descending towards gravity from a common acute term 180: which series has this property, that taking the two extremes, and any other two at equal distances, the four will be in geometrical proportion.

The octave, by immediate division, resolves itself into a fourth and fifth; the fifth, again, by immediate division, produces the two thirds; the two thirds are therefore found by division; though not by immediate division; and the name is true of the two thirds. Thus all the original concords arise out of the division of the octave; the fifths and fourths immediately and directly, the thirds and sixths mediately.

From the perfection of the octave arises this remarkable property, that it may be doubled, tripled, &c. and yet will preserve a concord, i.e. the sums of two or more octaves are concords; though the more compound will be gradually less agreeable: but it is not so with any other concord less than octave; the doubles, &c. of which are all discords.

Again, whatever sound is concord to one extreme of the octave, is concord to the other also; and if we add any other simple concord to an octave, it agrees to both its extremes; to the nearest extreme it is a simple concord, and to the farther a compound one.

Another thing observable in this system of concords is, that the greatest number of vibrations of the fundamenta cannot exceed five; or that there is no concord where the fundamental makes more than five vibrations, to one coincidence with the acute term. It may be added, that this progress of the concords may be carried on to greater degrees of composition, even in infinitum; but fill the more compound, the less agreeable.

So a single octave is better than a double one, and that than a triple one; and so of sixths, and other concords.

Three or four octaves form the extremes of all the intermediate sounds; what will afford all the variety of pleasure the harmony of sounds is capable of affording, or at least that we can receive; for we can hardly rate any sound beyond that compass, either by voice or instrument, that shall not offend the ear.

The phenomena attending simultaneous sounds have been considered by Euler, and treated of in his clear and peripatetic...
CONCORD.

On testing a simple musical sound, our ear is struck with a series of vibrations equally distant from each other, the frequency and number of which, in a given space of time, contribute the difference which subsists between low notes and high; so that, the smaller the number of vibrations or strokes produced in a given time, by a second, the lower we estimate that note; and the greater the number of such vibrations, the higher is the note. The perception of a simple musical sound may, therefore, be compared to a series of dots equidistant from each other, as . . . . . . .

If the intervals between these dots be greater or smaller, the sound produced will be lower or higher. It cannot be doubted, that the perception of a simple sound is somewhat familiar, or analogous, to the sight of such a series of dots equidistant from each other: we are enabled thus to refer to the eye, what the ear perceives on hearing sound. In the distance between the dots were not equal, or if these dots were scattered about confusedly, they would be a representation of a confused noise, inconsistent with harmony. This being laid down, let us consider what effect two sounds emitted at once, will produce on the ear. First, it is evident, that if two sounds are equal, or if each performs the same number of vibrations in the same time, the ear will be affected in the same manner as by a single note; and, in music, these two notes are said to be in unison, which is the simplest union or combination of two sounds: we mean by the term the blending of two or more sounds heard at once. But if two sounds differ in respect of low and high, we shall perceive a mixture of two series of pulsations, in each of which the intervals are equal among themselves, but greater in the one than in the other; the greater intervals corresponding to the lower note, and the smaller to the higher. This mixture, or this combination of two notes, may be represented to the eye by two series of dots, arranged on two lines, A B, and C D;

```
A 1 2 3 4 5 6 7 8 9 10 11
B 12
C 1 2 3 4 5 6 7 8 9 10 11 12
D
```

and in order to form a just idea of these two series, we must have a clear perception of the order which subsists among them, or, in other words, of the relation between the intervals of the one line and of the other. Having numbered and marked the dots of each line, and placed No. 1 under No. 1; those marked with the figure 2, will not exactly correspond, and still less those marked 3; but we find No. 11 exactly over No. 12; from which we discover that the higher note makes twelve vibrations, and the other only 11. If we had not affixed the figures, the eye would hardly have perceived this order; it is the same with the ear, which would with much difficulty have traced it in the two notes, which are represented by two rows of dots. But in the following figure,

```
1
2
3
4
5
6
7
8
9
10
11
12
```
you discover at the first glance, that the upper line contains twelve as many dots as the under, or that the interval8 in the under are twice as great as those of the upper. Th9 is undoubtedly next to unison, the simplest of all cases, in which you can at once discover the order which subsists between these two series of dots; and the same thing holds with respect to the two notes represented by these two lines of dots: the number of vibrations contained in the one, will be precisely the double of the vibrations contained in the other, and the ear will easily perceive the pleasing relation of these two sounds; whereas, in the preceding case, it was extremely difficult, if not impossible, to discriminate. When the ear readily discovers the relation subsisting between two notes, their combination is denominated consonance; and if it be very difficult, or even impossible, to catch this relation, the combination is termed dissonance. The simplest consonance, then, is that in which the high note produces precisely twice as many vibrations as the low note. This consonance, in the language of music, is called octave; every one knows what it means; and two notes which differ precisely in octave, harmonize perfectly, and possess such a complete resemblance, that musicians mark them by the same letters.” Euler’s Letters, vol. i.

Let the series of equal parts contained in the parallel right lines 01, 02, 03, &c., figure a, Music-Plates, represent the series of equal times between the successive pulses of air that beat on the ear, when the single sounds 01, 02, 03, &c. are heard respectively; then, when any two of these sounds are heard together, the combination of the two corresponding lines, will rightly represent the two series of equal times, if the magnitude of the equal parts in one line be to the magnitude of those in the other, in the ratio of the single vibrations of the sounds; or, the whole lines being supposed equal, if the number of aliquot parts in each be severally the same, as the least numbers of the vibrations of each sound, made in the same time. And the points which divide the separate lines, will subdivide the combined lines into smaller portions, as in fig. b, where 04 represents a third series, or cycle of times, in which the pulses of the sounds 02 and 03 interchangeably succeed each other in beating upon the ear; in like manner 04 and 05 will represent the cycles respectively produced, by the union of the sounds 03 and 04, in the first case, and 03 and 05 in the second case, &c. See Cycles.

According to Dr. Smith, (Harmonics, p. 15.) such a mixture of pulses, succeeding one another in a given cycle of times, terminated at both ends by e incident pulses, and sufficiently repeated, is the physical cause that excites the sensation of a given consonance or concord; especially when considered as distinct from any other consonance, whose single vibrations having a different ratio from that of the former, will constitute a different cycle, and excite a different sensation. And although the absolute times may be different, yet if the ratio is the same, the consonances are similar, and may be looked upon as the same in this respect, that their cycles have the same form; the times in both having the same order, and the same proportions. And that this form of the cycles serves to excite the sensation of a particular concord, is evident, from considering, that if the agreeable sensation of consonances, according to the received principle in harmonics, be the result of the frequent coincidences of their pulses, and consequently be more or less agreeable, according as the coincidences are more or less frequent; all the consonances in tempered systems, whose vibrations are incommensurable, ought to be the greekest discords in nature; it being impossible for their pulses to coincide more than once in an infinite time. For as no two numbers, how large soever, can express the ratio of such vibrations, so no multiple of one vibration can ever be equal to any multiple of the other. And yet experience shews that
that such confonances are much more agreeable than perfect discords, whose pulses coincide very often.

We may, indeed, says Dr. Smith (p. 99.) approach as near as we please, and certainly much nearer than the lente can dilullh, towards the exact magnitude of an incommensurable ratio, by the ratios of whole numbers; but as these will grow larger and larger without bounds, so will the time between the successive coincidences, or the length of the approximating cycle of the pulsus by which it is meant the time of either of the incomensurable vibrations, multiplied by the heterologous term of the approximating ratio. Let any man tell us then where we may stop, and which of those cycles it is, whose repetition excites the determine fenation of the confonance.

The like difficulty occurs in approaching gradually even to a commensurable ratio of the vibrations of any perfect confonance. For, if either of its vibrations be pretty much altered at once, and then be made to approach by degrees to its former length, the terms of the several approximating ratios will grow larger and larger without bounds, and in regular order, except when ratios occur whole terms are reducible; and the cycles of their pulses will accordingly be longer and longer, and their coincidences fewer without limit, those interruptions excepted; and yet the confonance will grow better and better by regular degrees, till it arrives at perfection, as is certain by experience. For instance, the ratio 10 to 21, 300 to 221, 3000 to 2101, &c. approach nearer and nearer to 3 to 2. and the Viths, whose vibrations are in those ratios, grow more and more harmonious, though the cycles of their pulses grow longer and longer to infinity.

It seems indispensible, that coincident pulses are not necessarily to such harmony as the ear judges to be perfect. For if any long period of imperfect unisons, intercepted between two beats, be lengthened greatly and indefinitely, as in tuning an instrument, any given part of it, as long as any musical note, will approach indefinitely near to perfect unisons; certainly nearer than the ear can dilullh, as being often doubtful of their perfection. And yet throughout that part (supposed to be small in comparison to the whole period) the pulses of one found divide the intervals of the pulses of the other very nearly in a given ratio, of any determined magnitude, between infinitely great and infinitely small, in proportion to the distance of that part from the periodical point or point of coincidence. Nevertheless, the ear cannot distinguish any difference in the harmony of such different parts, as is evident by often repeating the same confonance, which can hardly begin confluently in the same place of the long period, and this argument applies to all other confonances besides unisons.

Dr. Robinson supports this train of argument, by a reference to the well known fact, that if two musical instruments, as two organ pipes, tuned so exactly in unison that their pulses may be supposed to begin and end at the same instants, making the most perfect coincidence of pulses, be placed at a given distance from each other, and sounding the confonance will be perfectly the same, in whatever part of the room or space round the sounding pipes the ear of an auditor may be placed; while, owing to the time taken up by found in travelling through a given space, it is evident that the supposed coincidence of the pulses in the sounds cannot so affect or reach an ear unless it be placed exactly at equal distances from each of the sounds; whereas, by placing himself exactly in the middle of the right line joining two union sounds, and gradually approaching one of the sounds, every possible diludation or deviation of the pulses from coincidence will prevail, in their action upon one of the ears of an observer, while in most cases the other ear will be very differently affected, owing to its relative distances from the sounding bodies being different. And hence, as Dr. Robinson concludes, — a musical found is the termination of a certain form of the aerial undulation which agitates the auditory organ. The perception of harmonious found is the sensation produced by another definite form of the agitation; this is the composition of two other agitation; but it is the compound agitation only that affects the ear, and it is its form or kind which determines the sensation, making it pleasant or unpleasant, or in other words, a concord or a discord.

On the supposition that nature has appointed no certain limits between concords and discords, Dr. Smith (Harmon. p. 15.) inquires into the order of simplicity of the confonances between different founds, perfectly adjusted according to their ratios, on the principle, that one confonance may be considered as more or less simple than another, according as the cycle of times belonging to it is more or less simple than the cycle belonging to the other, or, as the sum of the least terms expressing the ratio of the single vibrations is smaller than the like sum in the other confonance; and that, when several such sums are the same, those confonances are Simpson to the same order as the lesser terms of their ratios are smaller, and he divises the confonances in a table, differing little, except in arrangement of the columns, from the following:

<table>
<thead>
<tr>
<th>Order of the Simplicity</th>
<th>Ratio of the Pulpae</th>
<th>Confonace</th>
<th>Order of the Simplicity</th>
<th>Ratio of the Pulpae</th>
<th>Discord</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 : 1</td>
<td>Union</td>
<td>16</td>
<td>1 : 1</td>
<td>XXIX</td>
</tr>
<tr>
<td>2</td>
<td>1 : 2</td>
<td>XII</td>
<td>16</td>
<td>1 : 2</td>
<td>10th</td>
</tr>
<tr>
<td>3</td>
<td>1 : 3</td>
<td>XV</td>
<td>16</td>
<td>1 : 3</td>
<td>18th</td>
</tr>
<tr>
<td>4</td>
<td>2 : 1</td>
<td>XIX</td>
<td>16</td>
<td>2 : 1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>1 : 5</td>
<td>XVII</td>
<td>16</td>
<td>1 : 5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>2 : 3</td>
<td>X</td>
<td>16</td>
<td>2 : 3</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>1 : 6</td>
<td>11</td>
<td>16</td>
<td>1 : 6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>1 : 5</td>
<td>VI</td>
<td>16</td>
<td>1 : 5</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>5 : 9</td>
<td>II</td>
<td>16</td>
<td>5 : 9</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>1 : 9</td>
<td>XXIV</td>
<td>16</td>
<td>1 : 9</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>3 : 8</td>
<td>14th</td>
<td>16</td>
<td>3 : 8</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>1 : 11</td>
<td>17th</td>
<td>16</td>
<td>1 : 11</td>
<td></td>
</tr>
<tr>
<td>13</td>
<td>1 : 10</td>
<td>XXVI</td>
<td>16</td>
<td>1 : 10</td>
<td></td>
</tr>
<tr>
<td>14</td>
<td>3 : 5</td>
<td>6th</td>
<td>16</td>
<td>3 : 5</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>5 : 3</td>
<td></td>
<td>16</td>
<td>5 : 3</td>
<td></td>
</tr>
</tbody>
</table>

The first and second columns of this table can scarcely need any explanation; the third contains the concords, major and minor, expressd as in the second column of the general table of concords, which follows in this article: the blanks in this column denote the discords, such as are marked with a *, being composed of primes larger than 5, as 7, 11, 13, &c., and have no existence in music, except in the false notes of
of the Trumpet, Horn, &c.; see those articles: the others, or their octaves, will be found in the table of Discords: see that article.

On the other hand, Dr. Robison and other writers have maintained, and we think fairly, that nature has not left the concord without other distinctions than those of the expressions and uncertain preference given to them by musicians, but in addition to the almost universal delight which concords afford to every description of auditors, that the phenomena of flow and audible beats, accompanying each concord, when slightly tempered either in excess or defect, sufficiently distinguish each from all other musical intervals, comprised properly under the denomination of discords, or imperfect concords; and we cannot but agree with Dr. R., in thinking, that the study of the principles of harmonics would be greatly facilitated by considering the concords as the elements or fundamental intervals of melody fixed by nature, and that we should proceed to supply the other steps wanting in the scale, from their differences or combinations, rather than by affuming the tones and hemitones (which are discords that the most refined ear cannot accurately distinguish) to be the elements for composing the practical intervals of music; which it is not meant to contend, that they cannot accurately do in theory, but that concords of the truth or exact magnitude of which ordinary ears can at once judge with sufficient exactness (while the curious can attain them in practice, by help of the beats, to any defined degree of accuracy) are better adapted to the purposes of harmonical computations and reafonings, and will admit of a more direct and perhaps also of some new applications in practice.

For illustrating this subject, we beg to allow to mention an experiment by Dr. Robison, made with a wheel monochord, perhaps improperly so named, because it had two strings, which, by means of a refined revolving wheel, could be made to yield clear and even sounds for any required space of time: one of the strings giving constantly the same sound, while the length of the other, after being accurately tuned in unison therewith, admitted of being shortened in any required degree, without altering its tension.

Beginning with the unison (but which was not exactly the order in the Doctor's experiment), the moveable bridge, which determined the length of the variable string, was slowly and gradually moved forwards: at first a very slow, and by degrees a quicker, beating of the imperfect unison was heard, which increased in rapidity until the beats could no longer be counted, and at length they became a violent rushing flutter, which degenerated into a disagreeable jar. Still advancing the bridge, vile discordant noises resulted from the sound of the two strings, until the variable string had been shortened nearly \( \frac{1}{2} \), or when a little more than \( \frac{1}{2} \) of the string continued to sound: when a very rapid angry flutter commenced, that became rather less rapid and offensive as the point \( \frac{1}{2} \) was approached, and again increased after that, until the discordant jar prevailed again; and this continued, until the \( \frac{2}{3} \) of the string was approached. When a similar flutter commenced, decreased, and again increased as this point was passed by the bridge; the jar beginning again, and accompanying the motion of the bridge, until it almost arrived at \( \frac{2}{3} \) of the string's length, when a flutter and rapid beat commenced, decreasing in frequency, until at \( \frac{2}{3} \), or when the minor third \( (\frac{3}{2}) \) was sounded, they ceased entirely, and the result was a concord rather agreeable than otherwise, but strongly marked by a mournful melancholy in the expression; which, being sufficiently noticed, the bridge was again advanced, and produced the same beating, flow at first, then quicker, and at length fluttering, until the like grating dissonance succeeded as before. This continued, until near the point marked \( \frac{4}{3} \), when the beating again commenced, having a peculiar frightful expression as they decreased in quickness, owing to the advance of the bridge, to the point of the major third \( (111) \), where the beats ceased, and the pungent and envenoming and gay character of this concord was experienced by the hearers, who noticed an angry and wrathful expression to accompany the succeeding beats as the string shortened, but which gave place gradually to the same flutter and jar as before.

When little more than \( \frac{4}{3} \) of the string's length continued to sound, the flutterings and rapid beats were again heard, and the latter decreased and ceased entirely, at the point marking the fourth \( (\frac{4}{3}) \) which was noticed as a soft and agreeable concord. To this first flow, and then rapid, beats succeeded, and rapid flutterings, and a jarring noise. Near \( \frac{5}{3} \) of the string the fluttering commenced again, and decreased until about into one could be counted in a second of time as the false IV was passed, after which they increased again in rapidity as the bridge advanced, and an indistinct and jarring noise succeeded, which soon again became a flutter that decreased until at \( \frac{5}{3} \) of the string about eight of the angry flutterers could be counted in a second, corresponding to the false fifth; after which they increased in rapidity, and the jarring noise was again heard.

The bridge being progressively moved, the flutterings began, beats succeeded, and passed into a gentle and not unpleasant undulation which ceased entirely at \( \frac{5}{3} \) of the string, when the fifth (V) with the cheerful sweetness which characterizes it, was heard in the accordance of the two sounds, neither of which could be separately distinguished: after which the flow and rapid beats, and fluttering, and jar succeeded as before. Some time before the bridge reached the mark for \( \frac{6}{3} \) of the string the flutter and beats began again, and at that point the minor fifth \( (\frac{6}{3}) \) a confluence in a slight degree pleasant was heard of a mournful character, without any beating, but which were heard to recommence and increase as the bridge advanced; and the jarring dissonance continued, until little more than \( \frac{6}{3} \) of the variable string was left sounding, when flutters and beats succeeded, and such ceased when the true major fifth \( (61) \) was heard, the character of which it was found difficult to express, otherwise than as being greatly inferior to the V in sweetness, and to the III in gravity, but passing in a lower degree both of these qualities: shifting the bridge forwards, beats, flutters, and discordant noises succeeded, attended with two perceptible changes to flutters, in its progress towards the \( \frac{5}{3} \) of the string; which was not reached without the violent flutters, rapid and slower beats, so often before described; but when the beats ceased the true octave \( (\frac{8}{3}) \) was heard, the treble note being with difficulty distinguished from the bas or fundamental afforded by the other string, and not at all if the notes were duly portioned in loudness. After this, if the bridge was still further advanced, beats, flutters, &c. succeeded as before, answering to the octaves of the sounds already described, as the bridge advanced to make half of the lengths of the former strings, respectively.

The doctor concludes his account of this very interesting experiment by remarking, that he has perhaps been rash in allusing certain moral or sentimental characters to certain concords; because he had few instances of persons who gave them different denominations, but these were very contradictory to his, but always expressed some sentiment allied to those above assigned. A person capable of a little determining reflection was never met with by the doctor, who did not acknowledge a manifest sentimental distinction among the different
different concords, which could not be confounded. Speaking in another place on this subject, the doctor remarks, that he had made numberless trials of the different concords with persons altogether ignorant of music; none of all thus examined had much pleasure from an octave; all without exception, were delighted with a fifth, and with a major third, and many of them preferred the latter. All of them agreed in calling the pleasure from the fifth a sweetness, and that from the major third a cheerfulness or fineness, or by names of similar import. The greater part preferred even the major sixth to the fourth, and some felt no pleasure at all from the fourth. Few had much pleasure from the minor third or minor sixth. Care was in the above instances taken to find these concords without any preparation, merely as founds, not as making part of any musical passage, circumstances which have great effect on the mind. When the minor third and sixth were heard as making part of the minor mode, all were delighted with them, and called them sweet and mournful. In like manner the chord never failed to give pleasure. Dr. Smith (Harmonics, p. 21.) seemed to think that the concords within the octave would be found to affect the ear with smoother and pleasanter sensations in the following order: viz. VIII, 5, 4, VI, III, 3, 6, the last being the least harmonious; but this conclusion he seems to have formed from the numerical simplicity of their ratios as expressed in his Table above, rather than from a series of experiments on their effects: but it is plain that this cannot express the order of harmoniousness, because four discordant will be found to intervene among the seven concords above, two of which also include the primes 7 and 11, which excludes them from our scale of music.

It will appear from the above, that each of the seven concords has a natural foundation and place in the scale of melody, but perhaps they will not all be found equally fit to be considered as elements in composing the scale. Reflecting which, it may be right here to observe, that no general and strictly accurate method of notation, for composing or viewing the relations of musical intervals, can have less than three terms (for logarithms are only an approximation to the ratios, depending on the number of places of figures used) whether these are the musical integers, 2, 3, and 5; the intervals T, 7, and 4, &c, or any other (Phil. Mag. xxiv. 105, and xxv. 140). The comparative perfection of the harmony of the VIII, V, and 4, the facility with which they are to be tuned by the ear, and the simplicity of their ratios 2, 3, and 2, might seem to point them out as the most eligible, for concordant elements of the scale, but considerable experience in these kinds of calculations and inquiries has led us to prefer the three smallest concords, or 4, 3, and 4 for this purpose; (see Common Chords) because subtration of the ratios is thereby most avoided, at the same time that the larger concords can by inspection be formed, out of these, in most instances. The following Table has been calculated and arranged with considerable care and trouble, and it will, we hope, prove useful to our musical readers in saving much of their time when pursuing these curious and useful speculations.

### A TABLE of the Relations which the several Concordts bear to the Key-Note, within the Comps of Seven Octaves.

<table>
<thead>
<tr>
<th>Intervals, Major and Minor</th>
<th>Logarithms</th>
<th>Common Logarithms</th>
<th>Ratios in their Component Primes</th>
<th>Tuneable Intervals</th>
</tr>
</thead>
<tbody>
<tr>
<td>13 6 3 2 1 2 4 5 6 8 7</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>8 4 5 6 7 8 9 10 11 12</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>9 5 6 7 8 9 10 11 12 13</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>6</td>
</tr>
<tr>
<td>10 6 7 8 9 10 11 12 13 14</td>
<td>4</td>
<td>5</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>11 7 8 9 10 11 12 13 14 15</td>
<td>5</td>
<td>6</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>12 8 9 10 11 12 13 14 15 16</td>
<td>6</td>
<td>7</td>
<td>8</td>
<td>9</td>
</tr>
<tr>
<td>13 9 10 11 12 13 14 15 16 17</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
</tbody>
</table>

Note: The table above is a continuation of the previous one, listing the concords and their relations to the key-note within the compass of seven octaves.
A TABLE of the Relations which the several Concords bear to the Key-Note, within the Compass of Seven Octaves.

<table>
<thead>
<tr>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>XXIX</td>
<td>e'</td>
<td>3/4</td>
<td>3.8798802</td>
<td>1/4</td>
<td>4 + III + VII, VI + 3, 6 + III, 7 + 1</td>
</tr>
<tr>
<td>2</td>
<td>XXVII</td>
<td>a'</td>
<td>1/2</td>
<td>3.88708026</td>
<td>1/2</td>
<td>4 + III + VI, VI + 3, 6 + III, 7 + 1</td>
</tr>
<tr>
<td>3</td>
<td>27th</td>
<td>b</td>
<td>1/8</td>
<td>3.89719718</td>
<td>1/8</td>
<td>4 + III + VII, VI + 3, 6 + III, 7 + 1</td>
</tr>
<tr>
<td>4</td>
<td>XXVI</td>
<td>e</td>
<td>1/16</td>
<td>3.92018571</td>
<td>1/16</td>
<td>4 + III + VII, VI + 3, 6 + III, 7 + 1</td>
</tr>
<tr>
<td>5</td>
<td>25th</td>
<td>f</td>
<td>1/32</td>
<td>3.93749718</td>
<td>1/32</td>
<td>4 + III + VII, VI + 3, 6 + III, 7 + 1</td>
</tr>
<tr>
<td>6</td>
<td>23rd</td>
<td>c</td>
<td>1/64</td>
<td>0.01772876</td>
<td>1/64</td>
<td>4 + III + VII, VI + 3, 6 + III, 7 + 1</td>
</tr>
</tbody>
</table>

The titles of the columns are placed at the bottom of the foregoing Table, because it is intended to be read from the bottom upwards, agreeably to the practice of musicians, who read their notes upwards. Column 1 contains the number of finger-key intervals or half-notes: it will be found of use in rough calculations respecting musical intervals; thus, suppose a VI were to be added to a 6, and it was required to know on what note the sum would fall, we have 9 + 8 = 17, which answers in the Table to the 11th, and which happens to be exactly their sum, as is evident by comparing column 7, fuppofe again, that it was required to know the interval answering to three III, we have in this case 4 x 3 = 12; this in the Table answers to the VIII, but it is evident from col. 7, that this is only an approximate value, because this is 4 + III + 3 instead of 3 III, the difference being an enharmonic diesis, or the Tierce wolf of earl Stanhope.

Column 2 contains the marks of the intervals, the major intervals being denominated by Roman, and the minor intervals by Arabic characters, or numbers. Column 3 shows the notes of the gamut, distinguishing the seven different octaves, the first or lowest by Roman capitals, the next by Italic small letters, the third by the same, the fourth by the same double accented, the fifth by three accents, and the sixth and seventh octaves by small figures or indices, to express the number of accents.

Column 4 contains the ratios of the several notes, in their lowest terms. Column 5 contains the common or Briggs's logarithms to eight places of figures, the last being separated by a comma, in order to agree with the common Tables;
Concord. Table}, which have only seven places: whenever this number only is wanted, the seventh figure must be increased an unit, in every case where the eighth figure in the table exceeds 5.

Column 6 shows the ratios, expressed in their component primes, for the convenience of decomposing the fame into tunable intervals, as explained in our article Comma; thus, the second fraction, or $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$ may be divided or expressed by $\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$, which shows it to be equivalent to $6 \times 8 + 6$, as in column 7. The fraction answering to the $\frac{1}{4}$, or $\frac{1}{2} \times \frac{1}{2}$ may be thus stated, viz., $\frac{1}{2} \times \frac{1}{2}$, or $\frac{1}{2} \times \frac{1}{2}$, the left term being negative, because the ratio or fraction expressing it is found reversed.

Column 7 contains several different values of each interval in colors, all expressed in tunable intervals, or chords; the first, in each case, is expressed in the concordant elements, or smallest concords 4, 3, and 3; the next expression in each line has one or more VIIth vii. in its composition; we have next given those tunable intervals, which are found to express each interval by two terms only; and have then added two others, (being all that our room would admit) of the various expressions in tunable intervals, which can be had for any concord in col. 2, especially if negative signs are admitted, as we have done in the lowest octave of our table. Matter for curious reflection will present itself to the musical student, who attentively considers the last column of our table, such as 11, that the octave is the only concord which admits of being added to itself, without producing a discord; 3rdly, that the complement of every concord to an octave (or to 2, 3, 4, &c. octaves,) is a concord; 4thly, that all the simple combinations by one, by two, or by three, of our concordant elements 4, 3, and 3, produce concords; 5thly, after these simple combinations are made, no farther ones can be made, except the addition of an equal number of each of the concordant elements (as $4 \times 3 + 3 \times 4 + 2 \times 3 + 3 \times 4$ &c.) without producing discords &c. If the difference between any two concords be wanted, as between the XVII and the X, such is readily obtained from column 7th thus; $4 \times 3 + 3 \times 3 + 3 \times 4 - 2 \times 3 - 3$ is equal to $4 \times 3 + 3 \times 3$, or the octave. The sum also of any concords, as a VI and a 6th, is thus obtained; $4 \times 3 + 3 \times 3 + 3 \times 4$, which answers to the 11th, as before observed, when explaining the uses of column 1.

It may be of use here to mention, that the differences between each adjoining concord, in each several octave in column 7, will be found to be $3^2$, $3 - 3$ (or the minor femtene, $3^2$), $4 - 3$ (or the major femtene $4^2$) $3 + 3$, or $V - 4$ (or the major femtene $4^2$), $4 - 3$ (or the major femtene $4^2$), $3 - 3$, and $3^3$; and this, whether we begin at the top or at the bottom of the octave, which shews that nature has distributed these fix concords, in a surprisingly uniform manner, between the union and the octave. The intervals which will, in addition to those above, be found by deducting every concord within the octave from each other, are, $4 - 3$ (or the minor tone $4^2$) and $4 \times 3 + 3$ (or the comma deficient tritone or harp fourth $4^2$).

It has been remarked by Mr. I. Holdin, that the number 6 combined with itself, or with every less integer, produces in every instance a concord, thus $6^2$, $6 \times 5$, $6 \times 4$, $6 \times 3$, and $6 \times 2$, express the union, $9^2$, $6 \times 8$, $6 \times 7$, $6 \times 6$, $6 \times 5$, and $6 \times 4$, express the concord, or Concordia, in Mythology, was personified by the Romans, and worshipped as a deity under this appellation. Concord is commonly represented on coins as a graceful female, holding a cup in her right hand, and in her VOl. IX.
his. The work is in four volumes folio, printed at Rome in 1621.

Of all the helps towards understanding the Hebrew Scriptures, says Dr. Geddes (Prospectus, p. 71) a good concordance is undoubtedly the most useful. But we yet want a good concordance; and the man who should devote five or six years to the compiling of one from Buxtorf, Calado, Noldus, Taylor, Kircher, Montfaucon, and Trompou, would do a flagitious service to biblical studies. Buxtorf's method of arrangement, with very little improvement, should be strictly followed; the errors of orthography rectified from the authority of manuscripts and other sources of emendation; and the various acceptions of the same word in the ancient versions exactly noted and methodically distinguished. Such a work would be worth all the commentaries that have ever been made.

We have several very copious concordances in English; as Newman's, &c. But the last and best esteemed is that in 4to. by Alex. Cronin.

CONCORDANT Elements. In Myers, are the fourth (ad') the major third (III) and the minor third (g'). See Concord. Dr. Smith considers the major tone (7) the minor tone (1) and the hemitone (6) as elements; Harmonics, p. 13.

CONCORDANT Verbs, such as have several words in common; but which, by the addition of other words, convey an opposite, at least, a different meaning. Such are these,

\[
\begin{align*}
\text{Et} & \quad \text{Consil} \\
\text{Lur} & \quad \text{in} \\
\text{Venus} & \quad \text{nutritur} \\
\text{Somnia} & \quad \text{servat} \\
\text{Oligia} & \quad \text{ogulat}
\end{align*}
\]

CONCORDAT, in the Canon Law, denotes a covenant, or agreement concerning some beneficiary matter, as a resignation, permutation, promotion, or the like.

The council of Trent, s. vi. de reform., cap. 4. speaking of concordats made without the authority and approbation of the pope, calls them concordatia, quae tantum host obli-
gant autore, non juraecum. And the congregation of cardinals, who have explained this decree, declares also, that a concordat cannot be valid so as to bind successors, unless confirmed by the pope.

The concordat is also used, absolutely, among the French, for an agreement concluded at Bologna in 1516, between pope Leo X. and Francis I. of France, for regulating the manner of nominating to benefices. The concordat leaves in lieu of the pragmatic function, which has been abrogated; or, rather, it is the pragmatic function restored and reformed. The king went in person to the parliament to offer the concordat to be registered, and letters patent were made out, requiring all the judges and courts of justice to observe this act, and see it executed. The parliament, after deliberating a month upon this important matter, concluded not to register the concordat, but to observe still the pragmatic function, unless the former edict was received and established in as great an assembly as that was, which published the latter in the reign of Charles VII. And when, by violence and force, they were obliged to publish the concordat, they joined to the publication a solemn protest and an appeal from the pope to the next general council, into which measures the university and the clergy entered with the greatest alacrity and zeal. But royal and papal deposition at length prevailed. The chancellor De Prat, who was principally concerned in promoting the concordat, has been generally regarded as an enemy to the liberties of the Gallican church. The illusory and learned Hainault has defended his memory against this accusation, and justified the concordat as an equitable contract, and as a measure attended with fewer inconveniences, than the pragmatic

function. He observes, that by the king's being invested by the concordat with the privilege of nominating to the bishoprics and vacant benefices of the first class, many corruptions and abuses were prevented, which arose from thefinancial practices that prevailed almost everywhere, while, according to the pragmatic function, every church chose its bishop, and every monastic its abbot. He observes moreover, that this nomination was the natural right of the crown, as the most considerable part of the great benefices had been created by the kings of France; and he particularly insists on this consideration, that the right which Christian communities have to choose their leaders, cannot be exercised by such large bodies without much confusion and many inconveniences; and that the subject, by entangling their sovereign with the government of the state, invexed him, by his faults, with an authority over the church, which is a part of the state, and its nobility branch. The most specious objection that was made to the concordat was this: that, in return for the nomination to the vacant benefices, the king granted to the popes the annates or first fruits, which had too long been complained of as an intolerable grievance. There is, however, no mention of this equivalent in the concordat. And it was by a papal bull that succeeded this compact, that the pontiffs claimed the payment of the first fruits, of which they had put themselves in possession in the year 1316, and which had been refused by the pragmatic function.

As the concordat gave to the kings of France the absolute right of succeeding to all the great, or what are called the confessional benefices, of the Gallican church; it was a very important edict. Since the establishment of the pragmatic function and of the concordat, the clergy of France in general (before the late Revolution) manifested levy respect to the decrees of the papal court than the clergy of any other Catholic country. In all the disputes which their sovereign has had with the pope, they have almost constantly taken part with the former. Their independence on the court of Rome seems to have been principally founded on this act.

The concordat between the pope and the republic of Venice resembles the former. There is also a German concordat, made between the emperor Frederic III. and the princes of Germany, in 1448, relating to beneficiary matters, confirmed by pope Nicholas V.

CONCORDAT, as it is now used in France, is a term that applies exclusively to an agreement or convention exchanged between the pope, Pius VII., and the French government, the 23rd Fructidor, an. 9. or September the 10th, 1801. In this agreement the Roman Catholic religion is acknowledged to be that of the majority of the French people; and the better to consolidate the restoration of its worship, which had been almost totally neglected since the year 1792, the pope engages not to disturb the proprietors or purchaser of estates, which, before the French revolution of 1789, belonged to the church; and he acknowledges in the first article of the French government the same rights and prerogatives which the ancient government possessed. By virtue of the said concordat, the whole territory of European France is divided into ten archbishoprics; viz., Paris, containing eight bishoprics, Mantes fevrau, Belfort five, Lyons four, Aix four, Toulon five, Bourdeaux three, Bourges three, Tours seven, and Rouen four; and fifty bishoprics; viz., Troyes, Amiens, Soissons, Arras, Cambrai, Verfailles, Meaux, Orleans, Namur, Tournay, Aix la Chapelle, Troyes, Gand, Liege, Mayence, Aulnay, Metz, Strasbourg, Nancy, Dijon, Mende, Gresorer, Valkcan, Cambery, Nice, Avignon, Ajaccio, Digne, Cahors, Montpellier, Careafon,
Concordat. Agen, Bajme, Poitiers, La Rochelle, Angouleme, Clermont, Saint Flour, Limoges, Le Mans, Angers, Nantes, Kennes, Vannes, Saint Brieux, Quimper, Coutances, Bayeux, Sizy, and Evreux. The nomination to the sees rests with the French government; the pope only confirms each nomination by his canonical institution, according to the forms anciently established with regard to the Gallican church, whose privileges and immunities continue in full force. The bishops, before they enter upon their functions, shall take before the first confab, in person, the oath of fidelity which was in use before the change of government, expressed in the following terms: "I swear and promise to God, upon the holy evangelists, to preserve obedience and fidelity to the government established by the constitution of the French republic. I also promise to have no correspondence, nor to affit at any council or cabal, either within the country or out of it, that shall be contrary to the caufe of the public tranquility; and if in my diocese, or elsewhere, I shall learn of any plot or machination prejudicial to the state, I shall inform the government of it." The clergy of the second order shall take the same oath before the civil authorities appointed by the government. The following prayer shall be recited at the end of divine service in all the Catholic churches of France:

Domine, fulvam fac rem publicam! Domine, fac tus fac confules!

The bishops shall make a new division of parishes in their dioceses, subject to the consent of the government: the bishops shall name the curés, subject to the approbation of the government. The bishops may, however, have a chapter in their cathedral, and a feminary in their diocefe, but the government is not engaged to endow them. All the metropolitan, cathedral, parochial, and other churches, undisposed of, shall be placed at the disposal of the bishops. The government engages to secure a suitable provision for the bishops and curés, whose diocefe and parishes shall be marked out by the new division. The allowance of the archbishops shall be 15,000 livres annually, and that of the bishops 10,000. Bishops may add to their titles the qualification of "citoynen," or "monfieur." No man can be named a bishop but a Frenchman, aged at least 35 years, having an attestation of his morals delivered by a bishop, and after an examination of his doctrine by a bishop and two priests; nor shall bishops quit their fees without the permission of the first confab. Bishops are required to visit every year a part of their diocefe, and the whole every five years. No clergyman shall be ordained as priest, who is not 25 years of age, and possessed of 300 livres annual revenue. The curés shall reside in their parishes; and priests, who do not regularly belong to any diocefe, shall not officiate. The clergy in general shall wear black clothes; and the bishops violet coloured frockings. There shall be a liturgy and a catechism for the French church. The names of the days shall be as in the ancient calendar; and Sunday shall be the day of rest for the public functionaries; nor shall any other holidays, except Sundays, be kept without the consent of the government. The bells shall only be rung for divine service. The same temple shall be consecrated only to one form of worship. The nuptial benedictions shall be only given by the clergy to those who have been married by the civil officers.

With regard to the Protestant religion, no person shall exercise the ministerial functions but a Frenchman; nor shall the Protestant churches and their ministers have any connection with any foreign power. The ministers and their communities shall pray for the prosperity of the French republic, and the confabs. No doctrine, nor alteration of doctrine, shall be published or taught, without being first authorized by the government. The maintenance of the ministers shall be provided for, wherever the property and oblations of the communities fall short. The articles for the liberty of foundations, in the organic laws of the Catholic worship, shall be common to the Protestant churches. There shall be two seminaries, one in the city of Toulouse, for the instruction of ministers of the confession of Augsburg; and the other at Geneva for the reformed churches. The professors are to be named by the first confab, and no minister to be appointed without a certificate of his having studied in the seminary of his religion. The regulations of the seminaries are to be settled by the government. The reformed churches of France shall have pastors, local consistorys, and synods. Their clergy shall be a corporation for every 400 souls of the same commune. Five consistorial churches shall form the district of a synod. The number of ministers or pastors in the same consistorial church cannot be increased without the authority of government; nor can the pastors resign without altering their motives to government, which shall approve or reject them. The title of election shall be presented to the first confab for his approbation. Each synod shall consist of a pastor and a notable of each church. The synods shall superintend the celebration of worship and conduct of ecclesiastical affairs, and all their decisions shall be submitted for the approbation of government. The synods cannot assemble until they shall have received the permission of government; nor shall any synodal assembly last more than six days.

The churches of the confession of Augsburg shall have pastors, local consistorys, inspensions, and general consistorys. The pastors and consistorial churches shall be subject to the regulations prescribed for the reformed pastors and churches. The churches of this confession shall be subordinate to the inspensions. Five consistorial churches shall form an inspension, which is to assemble only by permission of government. Each inspension to elect an inspector, and two laymen of such choice to be confirmed by the first confab. There are to be three general consistorys; one at Strasburg, for the Protestants of Augsburg, of the departments of the Upper and Lower Rhine; a second at Mentz, for those of the departments of the Sarte and Mont-Tonnere; and the third at Cologne, for those of the departments of the Rhine, Moselle, and Roer.

Concordat Militaire, Fr., an agreement entered into by officers of the same corps, to establish a fund or provision for one of them that quitted it. This agreement, however, was only tolerated in particular cases and circumstances, to which the chiefs seemed to consent, without either openly, or with their signatures, giving their approbation to the same.

Concordia, in Antiquity Geography, a town of Italy, with the title of colony; placed by Ptolemy in the country of the Carpi, but by Piny in that of the Veneti, between Pons Lignacum and Titalagum. Eutropius and the Itinerary of Antonine place it in Venetia. It took the name of Julia, because a colony had been sent thither by Julius Caesar.—Allo, a town of Spain, placed by Ptolemy in Lusitania, supposed to have been the present Tamar.—Allo, a town and Roman fortress of Gaul, in Germany Prima, between Broconum and Noviomagus, according to the Itinerary of Antonine.

Concordia, in Geography, a town of Italy, in the duchy of Mirandola, on the Sesia; 6 miles W. of Mirandola; between which cities there is a fine canal, which facilitates the communication of both.—Allo, a town of Italy, in the country of Triul; which, though in ruins, is the lee of a bishop, who resides at Porto Creton.
CONCOTS, a town of France, in the department of the Lot; 3 leagues S. S.E. of Cahors.

CONCOU, in Botany, a name given by the people of Guinea to an herb which is in great esteem with them for killing that troublesome sort of worm called the Guinea-worm, which breeds in their flesh. They bruise the leaves, and mixing them with oil, apply them in form of a cataplasm. The leaves of this shrub somewhat resemble those of the cargon, but they are thicker and flatter, and are not so full of veins. They are broaded within one third of the base, and from thence they go tapering to each end. They are placed on long footstalks of a fine green throughout. Phil. Trans. No. 232.

CONCOURS, in Geography, a town of France, in the department of the Aveiron, and district of Rhodex; 7 miles N. N. E. of Rhodex.

CONCOURSE, or CONCURRENCE, the reciprocal action of divers persons or things co operating toward the same effect or end.

The schoolmen distinguish two kinds of concurrence; viz. immediate, which consists in giving a power or faculty to act; and immediate, which is a contemporary influence of one cause along with another, to produce an effect. Thus, the grandchild concurs mediate to the production of a grandchild, as he originally gives the power of generating to the father; but the father concurs immediately with the mother to the production of the same child. With respect to the agency of God, some divines maintain both these kinds of concurrence; others deny the latter. See Cause.

Concourse, Point of. See Focus.

CONQUE, Fr. A piece of artillery, of which the bore is wider towards the muzzle than towards the breech. It is also the name of a shell, which the ancients made use of in their armies instead of a trumpet.

CONCRESSAUT, or CONCRASSAUT, in Geography, a town of France, in the department of the Cher, on the Saudre, almost ruined by the civil wars; 25 miles N. of Bourges.

CONCRETE, in the School Philosophy, an assemblage, or Compound.

Concrete, Physical, or a Concrete body, may denote any mixed body, or body composed of different principles; and consequently, all sensible bodies whatever, as all bodies arise from a coalition of divers elements, or at least of divers principles, matter, and form.

But, in this sense, concrete is only used for those compounds wherein the ingredients still retain their distinct natures, nor are wholly converted into any new common nature.

Authors distinguish natural concretes and artificial ones: antimony is a natural concrete, and soap a fictitious concrete.

Concrete Juice. See Juices.

Concrete, Logical, or a Concrete word, called also paronym, is that which has a compound signification, as denoting both the subject and some quality or accident of the subject, which gives it its denomination.

Such, e. g., are man, learned, cubite; for man signifies as much as having human nature; learned, as much as having learning, &c. Hence, the word concrete is chiefly used to express the union of qualities or quantities with the bodies or subjects, without any separation, even in idea. The opposite term, whereby things are separated in thought, is abstract.

Concrete properly signifies a subject accompanied with its form or quality; as pious, hard, cubite: abstract, on the contrary, expresses the form and quality without the subject, as piety, hardness, cubitaten.

Concrete Numbers, are those which are applied to express or denote any particular subject: as two men, three pounds, two thirds of a shilling, &c.

Whereas, if nothing be connected with a number, it is taken abradically or universally: thus, three signifies only an aggregate of three units; let those units be men, pounds, &c.

Concrete, the act whereby soft bodies are rendered hard; or an insensible motion of the particles of a fluid or soft body, whereby they come to a confluence.

The word is used indifferently for induration, concretion, coagulation, and concretion.

Concrete is also used for the coalition of several little particles into a sensible mass, called a Concrete; by virtue of which union, the body acquires this or that figure, and these or those properties.

Concrete, in Surgery, from concretio, the adhesion or growing together of parts. This term also denotes the impacting or cohering of substances together, so as to form a mass; as in the fangous concretion, the biliours or biliary concretion, the calculous concretion, &c. The coalescence of parts which ought to be separate, as of the fingers and eyelids, might be rather called agglutination or cohere.

Membranes and other parts may adhere together, either from natural or accidental causes; but the most frequent cause of external concretions is an ulceration or abrasion of the skin, so that two surfaces lying in contact shall unite by inflammation and reparation, or granulation. In all such cases, where an operation is practicable and necessary, the surgeon must separate the united parts with a seapal, and keep them alunde during the cure. See Stone and Calculus.

Concupination sometimes expresses a criminal or prohibited commerce between two sexes; in which sense it comprehends adultery, incest, and simple fornication.

Promiscuous concupiscence is productive of a great variety of evils, and tends not only to the corruption, but to the ultimate destruction, both of individuals and of society. It is not only ineffectual to promote love, and the tender affections, either between persons themselves, or towards their offspring, but it contributes towards exciting and maintaining endless jealousies and quarrels among mankind. The great and radical mischief attending unrestrained promiscuous concupiscence in a state of society, consists in its tendency to diminish marriages, and thus to defeat the several beneficial purposes resulting from this institution. (See Marriage.) It discourages marriage by weakening the force of a very urgent motive and temptation to it, arising from the intention of the original former of mankind, and the constitution of human nature. "The male part of the species," says Dr. Paley, "will not undertake the incumbrance, expense, and restraint of married life, if they can gratify their passions at a cheaper price; and they will undertake any thing rather than not gratify them."

A just idea may be formed of the magnitude of this mischief, by attending to the importance and variety of the uses to which marriage is subservient; and by duly considering that the malignity and moral quality of each crime are not to be estimated by the particular effect of one offence, or of one person's offending, but by the general tendency and consequence of crimes of the same nature. The libertine may not be conscious that those irregularities hinder his own marriage; from which, as he may allege, he is deterred by different considerations; nor may he perceive, or be disposed to acknowledge, that his indulgences hinder the marriage of others;
others; but it behoves him to reflect, what would be the consequences of universal licentiousness in this respect, and what should prevent its becoming universal, if it be innocent or allowable in him. Moreover, fornication supports prostitution; and prostitution entails on its victims almost certain misery, occasioned by the indulgence, disfigure, and infamy, to which these wretched outcasts of society, who infest populous cities, are subject; the whole aggregate of which is a great consequence of fornication, and to the increase and continuance of which, every act and influence of fornication contribute. Besides, fornication promotes habits of ungodly lewdness, which introduce the more aggravated crimes of seduction, adultery, violation, &c.; to which we may add, in this connection, that the criminal commerce of the sexes depraves the mind and moral character more than any sanguinary fact of whatever; these indulgences prepare an easy admission for every other crime: in low life, they are usually the first stage in men's progress to the most deplorable vilenesses; and, in high life, to that lamented disfigurement of principle which manifests itself in a profligacy of public conduct, and a contempt of the obligations of religion and moral probity. Habits of libertinism also incapacitate and indispose the mind for all intellectual, moral, and religious pleasures, which would very much contribute to counterbalance the calamities of human life.

It deserves further to be considered, that fornication perpetuates a disease, which may be accounted one of the severest maladies of human nature; and the effects of which are said to contaminate the constitution of even distant generations. This dreadful malady, the feverous scourge, says Dr. Robertson, (Hist. of America, vol. ii. p. 87), with which, in this life, offended Heaven chastises the indulgence of criminal defiles, seems to have been peculiar to the Americans; and he adds, that by communicating it to their conquerors, they have not only simply revenged their own wrongs, but by adding this calamity to those which formerly embittered human life, they have, perhaps, more than counterbalanced all the benefits which Europe has derived from the discovery of the New World.

Dr. Hartley, in his “Observations on Man,” (p. 413), remarks, that the shameful, loathsome, and often fatal disease, which peculiarly attends the vice of lewdness, may be considered as a most unquestionable evidence of the Divine Will. This disease, with all its consequences, would for various moral purposes, could it be brought under the restraints of lawful marriage; but must ever continue, whilst licentiousness continues. Without this check, however, the licentiousness which has always been observed to follow improvements in arts and politeness, and to attend upon bodies politic in their declension, and which the corruption of the Christian religion in some, and the disbelief of it in others, have, in a manner, authorized, would have brought on utter disfigurement in this western part of the world, such as would have been inconsistent with the very existence of regular government. Nay, it may be, that this will still be the case, and that we are hastening to our period, through the great wretchedness of the world in this respect particularly, though our lives, as a body politic, be somewhat prolonged by this correction.

If we appeal to the Christian scriptures on the subject of this article, it is certain that these sacred writings condemn fornication absolutely and peremptorily, and that they class this crime with murders, thefts, false witnesses, and blasphemies. Besides, the aggravated sin of idolatry is represented by adultery and fornication in the prophetical writings. Although the scriptures give no sanction to those statutes which have been imposed upon the world under the name of Christianity, as the censures of the clergy, the practice of perpetual virginity, the "prohibito concubitiis cum gravida," yet, with a just regard to the condition and interest of all human species, as they have professedly been the frame of one man with one woman, an adequate gratification for the propensities of their nature, and have refrained them to that gratification. The avowed separation, and in some countries the licencing, taxing, and regulating of public brothels (see Bawdy houses), have appeared like a fiction of fornication, and have contributed, with other concurring causes, so far to vitiate the public opinion, that there is no practice, the immorality of which is so little thought of or acknowledged, although there are few in which it can be more easily and more satisfactorily evinced. The legislators who have patronized receptacles of prostitution ought to have foreseen this effect, and also to have considered, that whatever facilitates fornication, diminishes marriage. As to the usual apology for this relaxed discipline, the danger of greater enormities if access to prostitutes were too freely watched and prohibited, "it will be time enough," says Dr. Paley, "to look to that, when the laws and magistrates have done their utmost." After all, these fears are without foundation in experience. The men are in all respects the most virtuous, in countries where the women are the most chaste.

In its more refrained senses, cohabitation is used for a man's and a woman's cohabiting together in the way of marriage without having passed the ceremony thereof.

This species of cohabitation is, without doubt, distinguished from vagrant concubinage, and by reason of its resemblance to marriage, may be thought to participate of the sanctity and innocence of that state. In modern phrase, it is denominated "the keeping of mistresses," under the favoured circumstance of mutual fidelity. For this practice the following kind of apology has been sometimes alleged:

"That the marriage rite being different in different countries, and in the same country among different sects, and with some, fearlessly any thing; and, moreover, not being preferred or even mentioned in scripture, can be regarded only as a form or ceremony of human invention; and that, consequently, if a man and woman betroth and confine themselves to each other, their intercourse must be the same, as if they were legally married; for the addition or omission of that which is a mere form and ceremony can make no difference in the light of God, or in the actual nature of right and wrong."

To this species of reasoning, archdeacon Paley has replied:

1. If the situation of the parties be the same thing in marriage, why do they not marry? 2. If the man choose to have it in his power to dismiss the woman at his pleasure, or to retain her in a state of humiliation and dependence inconsistent with the rights which marriage would confer upon her, it is not the same thing. 3. It is not at any rate the same thing with respect to the children. Moreover, as to the marriage rite being a mere form, and that also variable, the same may be said of signing and sealing of bonds, wills, deeds of conveyance, and the like, which yet make a great difference in the rights and obligations of the parties concerned in them. And with respect to the rite not being appointed in scripture, the scriptures forbid fornication, that is, cohabitation without marriage; leaving to the interpretation of the point to pronounce what is, or what makes, a marriage; in like manner as they forbid theft, that is, the taking away of another's property, leaving it to the municipal law to fix what makes the thing property, or what it is, which also,
as well as marriage, depends on arbitrary and mutable forms. Independently of the injunctions of scripture, the plain account of the scriptural seems to be this; it is immoral, because it is precarious, that man and woman should cohabit, without undertaking certain irrevocable obligations, and mutually conferring certain civil rights: if, therefore, the law has annexed these rights and obligations to certain forms so that they cannot be secured or undertaken by any other means, which is the case in this instance (for whatever the parties may promise to each other, nothing but the marriage ceremony can make their promise irrevocable), it becomes in the same degree immoral, that men and women should cohabit without the interposition of these forms. Paley’s Principles of Moral and Political Philosophy, vol. 1. b. 3. c. 2.

Concubinage was anciently tolerated: the Roman law calls it an allowed custom, liberty confectu. When this expression occurs in the constitutions of the Christian emperors, it signifies what we now call a “marriage in conscience.”

The concubinage tolerated among the Romans in the time of the republic, and of the heathen emperors, was that between persons not capable of contracting marriage together: nor did they even refuse to let inheritances descend to children which sprang from such a tolerated cohabitation.

Concubinage between such persons who looked on as a kind of marriage, and even allowed it several privileges: but then this concubinage was confined to a single person, and was of perpetual obligation, as much as marriage itself. Hottomans observes, that the Roman laws had allowed of concubinage long before Julius Caesar made that law whereby every one was allowed to marry as many wives as he pleased. The emperor Valentinian, Socrates tells us, allowed every man two.

Concubinage is also used for marriage performed with less solemnity than the formal marriage; or a marriage with a woman of inferior condition, and to whom the husband does not convey his rank, or quality.

Cujas observes, that the ancient laws allowed a man to espouse, under the title of concubine, certain persons, such as were esteemed unequal to him. On account of the want of some qualities requisite to sustain the full honour of marriage. He adds, that though concubinage was beneath marriage, both as to dignity, and civil effects; yet was a concubine a reputable title, very different from that of mis-treff among us.

The commerce was esteemed so lawful, that the concubine might be accused of adultery in the same manner as a wife.

This kind of concubinage is still in use in some countries, particularly in Germany, under the title of a half-marriage, morgengalic marriage, or marriage with the left hand; alluding to the manner of its being contracted, viz., by the man’s giving the woman his left hand instead of the right.

This is a real marriage, though without solemnity: the parties are both bound for ever; though the woman be thus excluded from the common rights of a wife, for want of quality or fortune.

The children of concubines were not reputed either legitimate or bastard, but natural children, and were capable only of donations.

They were deemed to retain the low rank of the mother; and were on this ground unqualified for inheriting the effects of the father.

Concubinage, in a Legal Sense, is used as an exception against her that sufh for dower, alleging thereby, that she was not a wife lawfully married to the party, in whose lands she seeks to be endowed, but his concubine. Brit. c. 107. Bract. lib. iv. tract. 6. cap. 8.

Concubine, a woman whom a person takes to cohabit with him, in the manner, and under the character, of a wife, without being authorized thereto by a legal marriage.

Concubine is also used for a real, legitimate, and only wife, distinguished by no other circumstances but a disparity of birth or condition between her and the husband. Du-Cange observes, that one may gather from several passages in the epistles of the popes, that they anciently allowed of such concubines. The fourteenth canon of the first council of Toledo declares, that he, who with a faithful wife keeps a concubine, is excommunicated; but that if the concubine served him as a wife, so that he had only one woman, under the title of concubine, he should not be received from communion, that she who had legitimate wives under the title of concubines.

In effect, the Roman laws did not allow a man to espouse whom he pleased; there was required a kind of parity, or proportion, between the conditions of the contracting parties; but a woman of inferior condition, who could not be espoused as a wife, might be kept as a concubine; and the laws allowed of it, provided the man had no other wife.

It is certain the patriarchs had a great number of wives, and that these did not all hold the same rank; some being subaltern to the principal wife, which was what we call concubines, or half-wives. The Romans prohibited a plurality of concubines, and only had regard to the children springing from a single concubine, because the might become legitimate wives. Solomon had 700 wives and 300 concubines; the emperor of China has sometimes two or three thousand concubines in his palace. Q. Curtius observes, that Darius was followed in his army by 365 concubines, all in the equipage of queens; and Diodorus Siculus says, that he maintained as many as the days of the year. Artaxersxes had by his concubines 115 children. The concubines were introduced to the Persian king, each in her turn; whence some have concluded, that the ancient Persian year consisted of 365 days, since several of the Persian monarchs had this number of concubines, who went to their kings in constant course.

Concupiscence, among divines, an irregular desire, appetite, or lust after carnal things, inherent in human nature.

The dominion or prevalence of concupiscence, according to T. Miletbranche, is what we call original sin.

The origin of concupiscence he ascribes to those impressions made on the brain of our first parents at their fall; which are still transmitted and continued on those of their children; for as animals produce their like, and with like images in the brain (whence the same sympathies and antipathies in the same kind; and whence the same conduct on the same occasions); so our first parents, after their fall, received such deep traces in the brain, by the impression of sensitive objects, that they might well be supposed to communicate them to their children.

The schoolmen use the term concupiscent appetite for the desire we have of enjoying any good; in opposition to irissible appetite, whereby we effect what is evil.

Concurrence. See Concours.

Concurring, or Concurrent Figures, in Geometry, such as, being laid upon one another, do exactly correspond to, and cover one another, and consequently must
must be equal among themselves. Thus, triangles having two sides and the contained angle equal each to each, appear to be equal to one another in all respects. See Con-

**CONCUSSION.**

**CONCUSSION crimen repetundarum, in Jurisprudence,** is the abuse of power by some person entailed with a public commissio or employment; by extorting money from those under his power or command. This crime is taken notice of in the heads of the Digell, or Code — al legem Judic. - and is remedied in the same, but with respect to the crime itself.

**Concussion, in Surgery, from concussio, a shaking together.** This term is most applied to a violent commotion of the body, and especially of the brain; but a concussion of the nervous system in general, or of the spinal marrow in particular, may produce the same train of symptoms in a partial degree, as a commotion of the brain does in the whole body. A concussion of the brain may be occasioned not only by blows on the head, but also by violence inflicted upon other parts of the body. It is frequently occasioned by a fall upon the thighs when stretched out straight, or upon the breech; it is also observed in cases of contusion of the face, and fractured bones, occasioned by a fall from a considerable height, in gunshot wounds attended with a splintering of the bones, and, in general, in every case of external violence attended with considerable commotion of the whole body. However, from whatever cause it may arise, it always requires surgical treatment.

When there are symptoms attending a fracture of the brain occur also in concussion; but in a compressed state of the brain they are more permanent. See Concussion.

There is no discharge of blood from the eyes, nose, or ears, which frequently happens in concussion; and instead of that apopleptic stertor in breathing which accompanies concussion, the patient seems to be in a sound and natural sleep. The pulse is irregular and slow in concussion, and grows stronger and fuller by bleeding; but in concussion it is weaker, being soft and equal, and sinks by bleeding. There are besides, convulsions in concussions, which are not observed in a state of concussion. The symptoms arising from concussion come on immediately after the injury is received. In the violent degrees of these, the patient remains quite insensible; the pupils are much dilated, and do not contract though the eyes be exposed to the strongest light.

In more violent accidents, especially when the patient is rendered insensible, it is extremely difficult to distinguish between concussion and depression; for symptoms which have been supposed to arise entirely from concussion, have, after death, been found to be owing to extravasation or undiscovered fracture; and extravasation has been blamed, when, on dissection, the leat morbid appearance could be discovered.

The symptoms consequent upon concussion of the brain are various, in proportion to the different degrees of the violence inflicted. In its lightest degree, it produces stupor and inclination to sleep, dulness of the intellectual and corporeal faculties, insensibility, or paralysis of some particular part. In the second degree, the patient lies without sensation and motion in a state of profound coma, from which he cannot be roused. But at the same time he is generally restless, tosses about, speaks much in his sleep, sometimes looks up, flares wildly, raves, is affected with convulsions, and generally his pulse betokens irritation. In the third degree, death supervenes, either immediately, or as the symptoms increase in violence.

These symptoms, however, are not always of the same nature and origin, and therefore require different methods of treatment. Thus the blood-vessels of the brain may be weakened in consequence of the violence inflicted; the blood may be preternaturally accumulated in them, and dilate them, to which sometimes also a congestion in the head contributes. Sometimes, also, the external violence acts upon the subflance of the brain itself and the whole nervous system, either by the irradiation or by the depression of parts of it, which it induces: in the first of these cases symptoms of delirium, delirious fits, want of sleep, or convulsions, are observed, and in the second the patient is thrown into a state similar to syncope.

Before the external violence has been inflicted, it may happen that the patient may have been in a state of great anxiety and fear, and he may have been greatly terrified by the danger whilst it was full impending, in which cases the consequences of these violent emotions of the mind, may be mistaken for effects of a concussion of the brain. The patient is in a very different state when the injury has been inflicted whilst he was intoxicated, or in anger, or when his stomach was full. Not unfrequently also some of the symptoms proceed from lesions of other parts of the body more remote from the head, or from collateral causes, especially from inflammatory, and bilious complaints in the vixera; which frequently produce not only a determination towards the head, but also various other symptoms indicative of irritation.

All these symptoms the surgeon must take into mature consideration, in order to be able to form a proper judgment concerning the state of the patient in whom he discovers symptoms of concussion of the brain. These symptoms are commonly of a fourfold nature; that is, they are symptoms indicative of compression of the brain, and arise from the congestions in the vessels; or they are symptoms of dulness and insensibility of the concussed nervous system; or they are symptoms of irritation in the nervous system; or finally, they are consequences of preternatural irritating causes in the abdominal vixera. Commonly the symptoms belonging to each of these four different heads are combined; but frequently those of one class are more violent than those of the rest, and to this circumstance the surgeon must especially attend in regulating his method of treatment.

With respect to the cure, much also depends upon making the proper distinction between the symptoms of concussion and those of extravasation. In many cases this may easily be done: for the symptoms of concussion come on immediately after the violence has been inflicted, whilst those of extravasation generally supervene within a longer or shorter time after. This criterion is however not always to be depended upon, nor discoverable in every case; for when the patient was alone at the time when the accident happened, and is now deprived of his senses, the surgeon cannot.
Concussion.

Whether the symptoms followed the accident immediately.

If the symptoms abate after the use of antiphlogistic remedies, such as blood-letting, evacuations, glisters, washing with cold water, &c., they ought to be continued but in the contrary case, they are to be relinquished and an opposite method of treatment adopted. The effects of blood-letting alone sometimes form an important criterion; for in cases of concussion of the brain it frequently lowers the pulse to a great degree, may, even aggravates the symptoms; whilst in extravasations, even though it be frequently repeated, it produces a far less decisive effect upon the pulse, and frequently alleviates the symptoms.

Amongst the various remedies that have been recommended in concussions of the brain, blood-letting is most generally employed; but it ought to be moderated. Topical abstraction of blood from the head has sometimes been found useful. Purgatives are always very serviceable, but in general it is necessary to administer them in large and repeated doses. Still more beneficial are emetics, and amongst these tartar emetic and vitriolated zinc commonly prove the most efficacious; though, on account of the insensibility of the patient, they must usually be administered in very large doses, in order to produce their effect. Many recommend also stimulating glisters, and various other stimulating remedies; such as the volatile alkalies, blisters applied to the head, and it is affirmed that some have even administered wine internally with the bell effects. Cold fomentations are here particularly useful, as they are adapted to all cases, as are likewise all the remedies usually employed in syncope. Where there are symptoms of irritation, spasms, and convulsions, antispasmodic remedies are frequently found to produce great benefit; and in these cases Dover's powder is particularly recommended. Before using it, the warm bath, and when the patient is plethoric, blood-letting is prefcribed. This remedy must be continued as long as the symptoms remain, and it must be repeated when they return. Also a mixture of three parts of Vin. Antimoni and one part Tinct. Theb. given in doses of ten drops every four hours, is found very useful. The use of laudanum alone has sometimes removed the symptoms of concussion.

Notwithstanding that all the above mentioned remedies and recommended by authentic experience, yet as they are so opposite to each other in their properties, it cannot possibly be advisable to prescribe them all together, or any single one in all cases; and the surgeon has therefore in every single case to choose those remedies that are particularly adapted to remove the most urgent symptoms of the case. Thus, when the symptoms of preternatural repletion of the vesicles of the brain are urgent, he must employ blood-letting, cold fomentations, evacuations, and glisters; to the latter of which it has been particularly recommended to add powder of squills: when the urgent symptoms are those of debility bordering on syncope, he may use volatile alkalies, wine, epiphatics, cold fomentations, emetics, and other tonic remedies; when the spasm, and symptoms are the most prominent, Dover's powder, Tinct. Antimoni, and laudanum; when the symptoms of bilious excitements prevail, emetics and purgatives.

As there is always reason at first to suspect an accumulation of blood, and to apprehend inflammation, it will almost always be advisable first to draw blood, unless it should be contraindicated by any peculiar symptoms. Stimulants and tonics will produce more benefit after the symptoms have continued for some time, than if administered at the beginning. If after the first or second blood letting, the pulse sinks whilst the other symptoms remain the same, or are even aggravated, it ought not to be perfused in, but a contrary mode of practice is to be attempted. We may expect advantage from blood-letting, purgatives, and emetics, when the pulse is full, hard, and quick; from antispasmodics, when it is small and hard; and from stimulant and tonic remedies, when it is small and soft. Neutral salts, gentle purgatives, and blood-letting, may be employed when the patient is strong, vigorous, plethoric, and fluid; stimulant antispasmodics, when he is weakly, very irritable, pale, and cold.

Finally, we must also attend to the state in which the patient has been before the injury: should he have received it whilst in a state of intoxication, cooling evacuations, and blood letting are necessary; if he has received it whilst his stomach was full, or whilst in a paroxysm of anger, emetics and antispasmodics are indicated; if whilst under the influence of great fear or apprehension, tonic and antispasmodic remedies will be proper. Moreover, the head of the patient must be carefully guarded against all motion and concussion during the course of the cure.

Should the patient recover under the use of the above-mentioned remedies, he must still for some time after carefully avoid all commotion of the head, and whatever tends to accelerate the circulation, as anger, wine, violent bodily exercise; it is also proper to continue still for some time, to wash or bathe the head in cold water; and sometimes to take tonic remedies, such as Peruvian bark, acid of vitriol, &c. When the patient, though in other respects recovered, still continues to labour under debility or paralysis of particular parts, these complaints may sometimes be removed by the continued use of internal and external tonics and stimulants, especially volatile alkali, emetics, blisters, electricity, &c. But when the symptoms increase in spite of the most careful treatment, the surgeon is authorized, especially when the diagnosis is doubtful, to suppurate an extravasation, and in the last instance he may be forced to amputate the part that has been injured. And supposing even that the surgeon has drawn a false conclusion, the operation of the trepan, skillfully performed, will do no harm, may, may even in some instances be productive of benefit, in consequence of the discharge of blood which it occasions.

On this important subject Mr. Abernethy's observations deserve particular attention. He is of opinion that the effects of concussion have not been justly described by authors, nor the symptoms related by them those which usually occur. In his Surgical Essays, he, therefore,-selects two cases out of many others, in order to shew what really are the common consequences of this injury named concussion.

"The whole train of symptoms following a concussion of the brain," says he, "may, I think, be properly divided into three stages. The first is, that state of insensibility and derangement of the bodily powers which immediately succeeds the accident. While it lasts, the patient fearfully feels any injury that may be inflicted on him. His breathing is difficult, but, in general, without tertor; his pulse intermitting, and his extremities cold. But such a state cannot last long; it goes off gradually, and is succeeded by another, which I consider as the second stage of concussion. In this, the pulse and respiration become better, and though not regularly performed, are sufficient to maintain life, and to diffuse warmth over the extreme parts of the body. The feeling of the patient is now so far restored that he is sensible if his skin be pinched; but he lies stupid, and inattentive to slight external impressions. As the effects of concussion diminish, he becomes capable of replying to questions put to him in a loud tone of voice, especially when they refer to his chief suffering at the time, as pain in the head,
CON

head, &c. otherwise, he answers incoherently, and as if his attention was occupied by something else. As long as the stupor remains, the inflammation of the brain seems to be moderate; but as the former abates, the latter seldom fails to increase; and this constitutes the third stage, which is the most important of the series of effects proceeding from concussion.

"These several stages vary considerably in their degree and duration; but more or less of each will be found to take place in every instance where the brain has been violently shaken. Whether they bear any certain proportion to each other or not, I do not know. Indeed this will depend upon such a variety of circumstances in the constitution, the injury, and the after-treatment, that it must be difficult to determine.

"With regard to the treatment of concussion, it would appear, that in the first stage very little can be done; and perhaps, what little is done, had better be omitted, as the brain and nerves are probably insensible to any stimulants that can be employed. From a loofe, and, I think, fallacious analogy between the insensibility in fasting, and that which occurs in concussion, the more powerful stimulants, such as wine, brandy, and volatile alkali, are commonly had recourse to, as soon as the patient can he got to swallow. The same reasoning which led to the employment of these remedies in the first stage, in order to recall sensibility, has given a kind of sanction to their repetition in the second, with a view to continue and increase it.

"But here the practice becomes more pernicious, and less defensible. The circumstance of the brain having so far recovered its powers, as to carry on the animal functions in a degree sufficient to maintain life, is surely a strong argument that it will continue to do so, without the aid of means which probably tend to exchange parts already weakened by the violent action they induce.

"And it seems probable that these stimulating liquors will aggravate that inflammation which nullifies or later endures. The access of it, in the cases which I have related, is sufficiently evident; and its cure is to be effected by the common methods. The great benefit of evacuations was, in those cases, very evident."

After some further remarks in opposition to the cordial plan of treatment, and the relation of a fatal case of simple concussion, in which that system would have been manifestly hurtful, Mr. Abernethy adverters to the very desirable object of pointing out the marks by which we may distinguish between compresion and concussion of the brain; for these, he apprehends, may in general be distinguished.

"As far as my observation goes," says he, "the insensibility is much less in concussion, especially after a short time has elapsed. Patients in this case, though they seem reluctant to answer questions, yet complain much if their heads are moved; and in those infirmities where it was judged necessary to inspect the bone, I have generally found they made great complaint during the operation. The pupils also are usually more contracted than in compresion of the brain; the muscles of the limbs retain their natural state of tone, and respiration is performed with little or no flectors, though the pulse generally intermits in a very considerable degree. In the lighter cases of concussion, the sicknes of the patient is often very great.

"But, in cases of compresion of the brain, circumstances very much the reverse of those just related take place; the sensibility is much diminished in proportion to the degree of the injury; from this cause also the pupils are dilated, and the limbs relaxed; the respiration is attended with flectors; and the pulse is subject to much less intermission."

COND, CON, or CONN, in Sea Language, signifies to guide or conduct a ship in her right course.

He that conds her, stands aloft with a compass before him, and gives the word of direction to the man at the helm, how he is to steer. See Steering.

If the ship go before the wind, or, as they call it, between the sheets, the word is either furlboard, or part the helm; according as the conder would have the helm put to the right or left side of the ship, upon which the ship always goes the contrary way.

If he says, below a midship, he would have the ship go right before the wind, or directly between her two sheets.

If the ship fail by wind, or on a quarter wind, the word is, aloof; keep your helm, fall not off, over no more, keep her to, touch the wind; have a case of the lee-latch; all which expressions are of the same import, and imply that the steersman should keep the ship near the wind.

On the contrary, it would have her fail more large, or more before the wind, the word is, cast the helm, no nearer, bear up.

If he cries boldly, it means, keep her from going in and out, or making yaws (as they call it), however the fail, whether large or before a wind; and when he would have her go joll as she does, he cries keep her thus; thus. &c.

CONDA, or Kond, signifies forrest, and often occurs as a termination of words in the south part of India, in this sense, as cotta and cote, which have the same significations, do in the north.

CONDABORA, in Ancient Geography, a town of Spain, placed by Ptolemy in Cilicia.


CONDALUS, in Antiquity, a kind of ring usually worn by slaves.

CONDAMINE, Charles-Marie de la, in Biography, a celebrated traveller, was born at Paris in the year 1701. In early life he distinguished himself as a military man; but quitting the profession of arms for the purpose of indulging a laudable curiosity, and a thirst for natural science, he diligently surveyed all the countries bordering on the coasts of the Mediterranean, and travelled into various parts of Leffer Asia, Egypt, and Turkey. He was elected a member of the Academy of Sciences, and proposed a voyage to the equator, in order to measure a degree of the mediter.

In 1736 he went, with other mathematicians, to Peru for this purpose, and exhibited the greatest affability and skill in accomplishing the work. On his return he descand the celebrated river of the Amazons; in this enterprise he
he suffered many hardships, which were, however, more than 
conquered by the indomitable, regions so remote, and so 
profuse of the wonders of nature, afforded him. Here he 
condensed the number of vibrations made by the same pendulum, which he had used at Paris, at Quito, and other 
places, and he found out that for 100,000 vibrations at Paris, 98,770 
were made by the same pendulum at the tide of the 
Amazons, 98,720 at Quito, and 98,720 on Pinch'ica. He 
published in the year 1745 an account of his travels, under 
the title of "Relación Abreviada d'un Voyage fait dans l'Inter 
deur de l'Amerique Meridionale," and in 1751, a 
"Journal du Voyage fait par Ordre du Roi à l'Equestre, 
avec un Supplemen, en deux Parties." Condamine, after 
a short residence at home, went to Italy, where he was 
honoured with the particular notice of the pope, who granted 
him a dispensation to marry his own niece. In 1752 he published 
some remarks on what he had seen in his tour through 
Italy. He then visited England, and, among other inter 
esting objects, he became warmly attached to the new prac 
tice of inoculation for the small-pox. On his return he 
published in two volumes "Memoires et Lettres sur l'Ino 
culation." About this period he was elected member of the 
French Academy of Belles Letters; he likewise received the 
same honour from several foreign learned societies, as 
those of London, Peterburgh, Berlin, and Bologna. He 
died in February 1774, in consequence of an operation for 
the hernia. "The acquisitions of M. de la Condamine," 
says one of his biographers, "were more extensive than pro 
founds; and he polished rather an ardour for making re 
searches on a variety of subjects, than patience completely 
also the article Bouguer.

CONDADORE, in Geography, a town of Hindoosfan, 
in the country of Golconda; 15 leagues E. of Adoni. N. 
latitude 15° 49'. E. longitude 76°.

CONDAPILLY, a town of Hindoosfan, and capital of 
a circle of the same name, near the bay of Bengal; 142 
miles S.E. of Hydrabad. N. latitude 16° 40'. E. longitude 80° 
45'.

CONDAPILLS, a circle of Hindoosfan, bounded on the 
N.E. by the circle of Ehlire, on the S.E. by the bay of 
Bengal, on the S.W. by the river Kíñnah, which divides 
it from Guantoor, and on the N.W. by the country of Gol 
conda; about 80 miles long and 25 broad.

CONDATCHY, a bay of Ceylon in the Eáil Indies, 
living on the west side of the island, six miles south from 
Arippo, and about 12 miles from Mannar. N. latitude 8° 45'. 
E. longitude 80°.

In this bay all the boats are collected for the 
pearl-fishery. The bay forms nearly a half-moon; the 
beach which surrounds it is an extensive sandy waiae, with 
only a few miserable huts scattered along the shore between 
the bay and the woods which skirt the beach. Such is the 
appearance which this bay presents at most seasons of the 
year; but during the fishery the scene is entirely reversed. 
At that time the bay is crowded with small vessels, and the 
beach presents an astonishing multitude of people from every 
quarter of India. The principal bank for the fishery is op 
posite to Condatchy, and lies out at sea about 20 miles. 
See Pearl-Fishery.

CONDATÉ, in Ancient Geography, an appellation, prob 
ably of Celtic origin, bearing relation to the idea of 
Coenat, and giving name to several towns, such as follow.

CONDAS, or REDONES, Remes, a town of Aramécia, 
the capital of the Redones, according to Ptolemy.—Allo, 
Monteau, a town of Gaul, between Meloduim and 
Ageidium, which afterwards bore the name of Monals 
riolium.—Allo, Combe, a place of Gaul between Noviomagas 
and Darocass.—Allo, Coas, a town of Gaul, between 
Nemurrum and Brivodurum.—Allo, Goynag, a town of 
Gaul, between Medionam Santonum and Vefnu na, according to 
the tab e of Peutinger.—Allo, a place of the Isle of Albion, 
between Manuicum or Manchelota and Dova or Chelet hit in,
Antonine’s Itinerary : generally placed at Congleton; but 
Mr. Horsey Lath made it very probable that it was some 
place near Northwicb.

CONDATEN-PERRIERES, in Geography, a town of 
France, in the department of the Tarn; 10 miles N. of 
Murat.

CONDATOMAGUS, in Ancient Geography, a place 
of Gaul, marked in the Peutingterian table between Sego 
dunum and Lutetia.

CONDAVIR, in Geography, a fortified place of 
Hindoosfan, and a principal port in the circuit of Guantoor; 
strongly situated on a mountain, eight coffes to the west of 
Guantoor, and ten from the bank of the Kíñnah. Not far 
from Condavir is Colose, a diamond mine on the southern 
bank of the Kíñnah. Condavir is distant S.E. from 
Hydrabad 143 miles; from Madras 276 miles; from Nagpaur, 
S. 385 miles; and N.E. from Seringapatam 414 miles.

CONDE, LEWIS I. De Bourbon, in Biography, was 
the son of Charles of Bourbon, duke of Vendome, and born 
in 1570. He distinguished himself when very young at the 
battle of St. Quintin, and behaved with great gallantry till 
the death of Henry II, when he became a leader of the 
Huguenots. He was accused of having been the principal 
conspirator of the conspiracy of Amboife, but, in the pre 
fence of the king, he vindicated his honour with all the 
intrepidity natural to him, and offered to maintain his 
independence in single combat against his accuser. He was let 
free, but engaging in another plot, he was condemned by 
his judges to have his head struck off on a scaffold before 
the king’s apartment. To the sudden death of the fore 
man he was indebted for his freedom a second time; he 
now openly put himself at the head of the Huguenots, and 
was admitted, with Admiral Coligny, to share their full 
confidence. After many and very important successes, he was wounded and taken prisoner in the battle of 
Dreux in 1562. At the battle of Jarnac 1569, he en 
countered the enemy with his arm in a scarf, and as he 
marched to the attack, the horse of his brother-in-law 
reared and broke his leg; superior however to this painful 
accident, he thus addressed his followers: "Nobility of 
France, know, that the prince of Condé, with an arm in a 
scarf, and broken leg, fears not to give battle, since you 
attend him." The village of Jarnac has been rendered me 
orable by the courage and constancy with which the 
Huguenots disputed the day; but their leader Condé, ex 
thuasted with fatigue, was surrounded and taken prisoner. 
Thrice to whom he had yielded his sword, had placed him at 
the foot of a tree, when Montegueau, captain of the duke 
of Anjou’s guards, shot him dead, in cold blood, in re 
venge of a private quarrel. This savage, and truly infa 
mous deed has affixed an indelible stain on the character of 
the duke of Anjou who was supposéd to have authorised it. 
The body of Condé, thrown upon an al, was carried to the 
castle of Jarnac, and after being exposed to the view of the 
victorious army, was delivered to the duke of Longueville, 
his brother-in-law, who caused it to be interred with thos 
e of his ancestors at Vendome. In his person, the prince of 
Condé was ungraceful and diminutive, yet his wit and vivi 
city rendered him a great favourite with the ladies. His 
amours gave occasion to the conclusion that he engaged in 
the cause of the Huguenots more as a party-man, than as a 
religious. This trait in his character was a foil to quali 
...
ties the most splendid, and to virtue the most heroic. Of high and determined courage, he was formed to shine in camps as well as courts, and though his income was narrow, he displayed a magnificence of temper worthy his birth and station. Nouv. Hist. Dict. Hist. de France.

Condé, Lewis II., de Bourbon, was born at Paris, Sept. 7, 1621. He was styled Duke d'Engignié, and is known in history, under the appellation of the great Condé. He succeeded to the rank of prince by his father's death in 1646. In his infancy he was of an extremely delicate constitution, and was sent into the country for the sake of pure air. At a proper age the prince took upon himself the task of governor, and selected, as his amiable, in this important business, M. de la Bouillé, a private gentleman, upon whom he could depend for the most exact attention to the orders given him. Two jouts were likewise assigned to him as preceptors, who, with some officers of high rank and eminent probity and discretion, formed the household of the young prince. With these attendants he went to Bourges, where he frequented the college of jouts, and became distinguished in every branch of learning. His inclination was evidently turned towards the military art, and at the age of eighteen he made a campaign under Marshal de la Meilh rage, that laid the foundation of that renown by which he was afterwards distinguished as the greatest general of his age. In the year 1643, he was entrusted with the command of the army opposed to the Spaniards who had invaded France; by a signal victory which he at that time gained, he was looked upon as the guardian genius of his country. So much confidence did he display on this occasion, that on the night preceding the battle, after he had made all the proper dispositions, he slept so soundly that it was necessary to awaken him when it was time to begin the attack. He then formed the project of besieging Thionville, and proposed the scheme to the council of regency, who unwillingly consented to it. The duke, contrary to expectation, carried it into execution with so much skill that the town soon surrendered. After this he was engaged in many combats in Germany, in one of which he threw his general's staff into the enemy's trenches, and led on a regiment, sword in hand, to recover it. The victories of the duke d'Engignié, and his great and growing reputation rendered him an object of jealousy to Cardinal Mazarin, who did everything in his power to thwart his ambitious projects. The treachery of the cardinal, and the artifices of the leaders of the country party, excited cabals and troubles, but the duke d'Engignié, who, by the death of his father, had succeeded to the title of the prince of Condé, was cared for by both parties. As he at length took part with the court, though he felt it was an ungrateful task, and he protected the minilor without feeling for him the least esteem.

The royal family left Paris privately, and went to St. Germain, upon which the parliament sent deputies to learn from the queen the cause of her departure; but Mazarin dismissed them contemptuously and without an answer. Exasperated at this, the people made a common caufe, and resolved to defend themselves against the power of the court. With about 8000 men, the prince of Condé formed a design of reducing above 500,000 entrenched behind walls. He had neither money nor magazines; nevertheless he triumphed over Paris, and this success added not a little to the glory he had already attained. During the siege he constantly deposed the troops of the malcontents; he prevailed on the army that marched to their assistance under Turenne, to abandon their general; he stopped the progress of the duke de Longueville, who had caused an insurrection in Normandy, and got the start of the Spaniards who were advancing to give him battle. Peace was at length concluded, but Condé alone acquired glory by this war; and after the treaty was signed, the prince traversed the streets in his coach alone. All perquisites of any rank paid their compliments to him, and he received a vote of thanks from the parliament. The people, however, were uneasy at the king's absence, and Condé at length brought the royal family to Paris amidst the acclamations of the public; for this he was not recompened in the manner which he had anticipated; he accordingly united with the malcontents, was arrested in 1650, and detained a year in prison. Soon after his liberation, he broke out into open revolt, and a civil war followed which was attended with various successes. Condé exhibited great prowess, and sustained his military reputation through the whole of this unhappy warfare, though he was engaged in the service of the Spaniards, the inconstant foes of his country, whom he had formerly obtained so much glory in refiling. At the peace of the Pyrenees in 1659, the re-establishment of the prince of Condé was made a condition. In 1668, he contributed very materially to the conquest of Franche-Comté. He took part in the invasion of Holland in the year 1672, and received a wound at the famous passage of the Rhine. He fought the bloody battle of Senef against the prince of Orange, in which he had three horses killed under him, and was anxious to lead to a fourth attack, but as an officer of three years, "No one but the prince of Condé was desirous of fighting any longer." After the death of his great rival Turenne in 1675, Condé was sent to check the progress of the imperial army, in Alsace, and displayed so much caution in this business, as he had before exhibited ardour and insubordination. By his confusmate prudence and judgment he forced the enemy to cross the Rhine, and then, full of glory, he resigned the military profession, and retired to Chantilly, where he spent the remainder of his days cultivating and patronizing letters and the fine arts, to which he had been always attached. During the last two years of his life his faculties had so much declined, that feebly a trait was left of the great Condé. He died in 1686 at Fontainebleau, leaving behind him two sons, by his wife, the niece of cardinal Richelieu. Nouv. Hist. Dict. Hist. de France.

Conde', in Geography, a small town of France, in the department of the Aisne, and chief place of a canton in the district of Chateau-Thierry, 9 miles S.E. from Chateau-Thierry. The place contains 508 and the canton 9613 inhabitants. The territory includes 253533575 square miles, 77 communities. Also, a fortified town of France, in the department of the North, on the confluence of the Haine and Scheldt, 9 miles N.E. from Valenciennes, known at present by the name of Nord Libre, which it took under the republican government of France. After a blockade of nearly four months, it surrendered to the Austrians on the 11th of July 1790, but was soon evacuated. It is the chief place of a canton in the district of Donay, and contains 5078 inhabitants. The territorial extent comprehends 253533575 square miles, 77 communities, and 13,021 inhabitants. Before the revolution of 1789, Conde' was a principality from which the princes of Condé derived their title. There are in France several other small towns of the name of Conde', which signifies confluence, from the Latin confluent, circumducunt, and means a place built on the spot where two rivers meet. See Condé.

Conde', a town of France, in the department of Calvados, on the river Nive, or Nireu, chief place of a canton in the district of Vire, 24 miles S. from Caen, and 150 W. from Paris. The place contains 5039.
and the canton 10,681 inhabitants. The territory includes 12,351 kilometres, and 12 communes. The inhabitants carry on a considerable trade in cloth, leather, and cutlery.

Conde for Imm, or Conde in Eveux, a town of France, in the department of the Eure; 12 miles S.W. of Evreux.

Conde, a town of France, in the department of the Orne, and district of Bellefle; 10 miles E. of Bellefle.

Conde, a cape or promontory of North America, in the province of Yucatan; 100 miles W. of Merida. N. lat. 20° 50'. W. long. 95° 37'.

Condemnation, the act of passing, or pronouncing sentence, or giving judgment against a man; whereby he is subjected to fine, penalty, punishment, or death.

Condemnation to the galley. See Galley.

Condemnation of prizes taken from the enemy. See Prize.

Condensation (from condenfate, and condenate from the Latin condensata), denotes the contraction of a given quantity of matter into a smaller space, and in this sense only the word condensation ought to be used; however, in common language, the infilling, the thickening, or hardening of certain compound substances, in consequence of the escape of some of their component ingredients, is frequently expressed by the same term; thus the juices of fruit, of plants, of meats, &c. are often said to be condensed over the fire. Condensation and condensation (though sometimes used the one for the other) differ in this, viz., that the former denotes a diminution of bulk, occasioned by the application of external force; whereas the latter expresses the same effect, when produced without that external application, as it is the case with moist bodies in cooling. But the word condensation has been more commonly used for denoting the conversion of vapour into water, or of vapours in general into liquids.

The particulars which might be noticed with respect to condensation are, the quantity and rate of contraction in different bodies, the causes which produce it, and the limits of that contraction. These particulars, however, will, with more propriety, be stated under the articles Expansion, Thermometer, and Pyrometer, which see.

Notwithstanding the above-mentioned definition, it is to be remarked, that in every case of condensation, or of the contraction of a body into a narrower space, the effect is produced by the escape of something; and in bodies, which seem to be the simplest in nature, the contraction which they undergo in cooling, is occasioned by the escape of the caloric, which the present state of phæophysial knowledge reckons amongst the elementary substances. But the reverse of this proposition is not always true; viz., bodies are not always contracted in their dimensions when the caloric escapes from them; and such has been found to be the case with water, with iron, and with some other substances, in certain temperatures. This will be rendered more evident in the sequel.

Most bodies are susceptible of three successive states of existence; namely, the solid, the liquid, and the elastic or vaporous; and all these are effected by the introduction of different doses of caloric. During every one of those states, a different degree of condensation is produced by the intermediate gradations of temperature; viz., such as are not quite sufficient to induce a different state of existence in the body concerned. Thus, a quantity of the vapour of water, which, at the temperature of 242° (Fahrenheit's thermometer), and under the mean gravity of the atmosphere, occupies the space of 3500 cubic inches; if it be gradually cooled until the temperature becomes equal to about 212°, its bulk will be contracted so as to occupy half the space it did before, viz., about 1800 cubic inches. If the temperature be lowered below 212°, the vapour will be condensed into liquid water, which will occupy the space of not more than a single cubic inch. If the cooling be continued, the water will be condensed in its bulk, but not very regularly (that is, the decrements of bulk will not be exactly proportional to the decrements of heat); until the temperature approaches to about 32°. Below that degree, the water, instead of contracting its bulk, is expanded by further cooling; viz. by a further abstraction of caloric. This is a very remarkable property of water, upon which some interesting phenomena of nature are depending. The water, though expanding below the temperature of 27°, still continues fluid as far as about the temperature of 32°; but below this last mentioned point, by farther cooling it becomes a solid; namely, ice; and in this state water occupies a greater space than it did in a liquid state. (See Congelation.) Similar irregularities have been observed in the condensations of several other bodies, both solid and fluid; and it is to be wished that experiments capable of determining the laws of condensation were inculcated with all those bodies which are at all susceptible of the trial.

The causes of condensation are by no means thoroughly understood. It may seem, at first sight, sufficient to say, that since caloric is an elementary substance, which is combined in various proportions with every other known body, the separation of part of that element from the other bodies, naturally enables the particles of the latter to come closer to one another in virtue of their mutual attraction. But that this cannot be the sole cause of the condensation in its whole extent, is easily pointed out by the following queries.

1. Are the particles of bodies dissolved, that they may be capable of approaching, or of receding from each other? 2dly. Why the degrees, or quantities, of condensation are not always proportionate to the degrees of caloric that are abstrafted from bodies? And, 3dly. Why clouds, fogs, mists, &c. which confit of the vapour of water suspended in the atmosphere) are not always condensed into liquid water below the temperature of 212°; which is actually the case in the atmosphere?

It has for a long time been an opinion prevalent amongst philosophers, that the particles of bodies do not actually touch one another; for otherwise it seemed impossible to comprehend how a body could be expanded and condensed. But the least consideration will easily suggest a variety of dispositions of the particles, which, whilst they actually touch one another, will readily admit of the dilatation and condensation of the aggregate. Conceive, for instance (as professor Prevost of Geneva judiciously observes), the particles to be elongated, and united at their extremities like the legs of a pair of compasses, and they may then, with regard to this point of union, as a centre, and produce condensations and dilatations of the whole apparent mass of the body. A sponge likewise will dilate in water without interrupting the continuity of its parts. One may also conceive the particles of bodies arranged in the form of rings; that is, many of them to be in absolute contact, one with the next, and this with the following, &c. so as to form circular or oval rings. With this disposition of particles, the dilatation and condensation of the aggregate is nothing more than an alteration of the form of those rings; viz. they become more like circles when the body is expanded, and more oblong when the body is condensed; it having been demonstrated by mathematicians, that the circle comprehends an ampler space than any other figure of the same periphery. Though the general disposition of the particles of a body is not known, yet a variety...
riety of phenomena clearly indicate that they are not confoundedly placed; but that some arrangement, probably a peculiar one, for the particles of each different body, actually takes place; and to this peculiar arrangement some of the effects of dilatation and condensation, at least the irregularities of those alterations, must undoubted be attributed. Thus the particles of water crystallize in freezing; that is, they displace themselves with a peculiar regularity, somewhat resembling the filaments of a feather. These filaments of water form angles of about 60 degrees with a larger filament, which is, as it were, the item of the feather; and to this crystallization the enlargement of the bulk of water in freezing is with propriety attributed. Such is the force with which the particles of water endeavour to arrange themselves in that particular order, and of course to enlarge the bulk of the aggregate, that several astonishing effects are produced by their united efforts. Pieces of timber, stones, and other bodies, are buried by the freezing of inclosed water. Even iron mortars—hulls, such as are used in war, filled with water, and accurately flopped, have been buried by the freezing, and the consequent enlargement of the inclosed water.

Since the enlargement of the bulk of water commences at about the temperature of 45°, which is 10 degrees above the point of melting ice, commonly called the freezing point, which is 32°, it is evident that the particles of water begin to arrange themselves in a particular order long before the freezing takes place. And, by following the analogy, it may be supposed, that in every state of existence the particles of bodies have, more or less, a tendency to arrange themselves in a certain order; to which tendency the irregularities in the constitution of bodies are probably to be attributed.

The above-mentioned particulars, respecting the condensation of water, must in great measure be understood to belong to a great variety of bodies; for all those which have been subjected to deceptive experiments have been found to contract or to enlarge their bulk with irregularity, in some part at least, if not throughout, the whole scale of heat.

The condensation of vapour in the atmosphere, which is not always accompanied with a proportionate degree of temperature, forms another difficulty, which the present state of philosophical knowledge is not entirely capable of explaining. We shall, however, briefly state certain facts and certain considerations, which ought to be kept in view by those who are willing to investigate this intricate and interesting subject. The conversion of water into vapour is attended with an increase of its capacity for containing heat, or caloric, and likewise with an increase of its capacity for containing electric fluid; so that if a quantity of water, held in an open and inflated vessel, be suffered to evaporate, the vapour will deprive the vessel of part of its heat, and of part of its electric fluid: consequently, the vessel will be cooled and electrified negatively. Now that which philosophers wish to ascertain is, whether the influx of the caloric and of the electric fluid produces the evaporation, or the conversion of the water into vapour draws the caloric and the electric fluid from the contiguous bodies. In the first case, we fee no reason why the caloric and the electric fluid should spontaneously quit the contiguous bodies, and run to the water in order to force it to evaporate, because both the water and the contiguous bodies are in an equilibrium; that is, in the same state with respect to temperature as well as of electricity. In the second case, if the influx of heat and of electricity does not force the water to evaporate, what other cause can produce that effect?

The same reasoning which has been applied to the conversion of water into vapour, may, mutatis mutandis, be adapted to the contrary effect; viz. to the condensation of vapour into water, it being equally difficult to comprehend how the vapour can remain in the elastic state, that is, without being converted into water, at a temperature much lower than 212°, which in the atmosphere is generally the case.

There is one consideration, however, which may throw some light upon this remarkable phenomenon; viz. that in order to deposit the caloric and the electric fluid, which must necessarily take place in the condensation of vapour, there must be a body or bodies ready to receive both. But in the atmosphere, the only body which can receive them is the air, and it is well known, that air is a bad conductor of heat as well as of electricity. The last remark which we have to subjoin is, that it has been observed with several substances, and especially with water, that though placed in a colder temperature, they do not part with their caloric so easily as it might be expected, and this is particularly the case when they are to undergo a change in their state of existence; thus water will sometimes continue fluid when its temperature is 4 or 5 or even more degrees below 32°; though when once formed into ice, this will not melt at a temperature lower than 2°, and yet it will evaporate if exposèd to the air while its temperature is many degrees below 32°.

**CONDENSER.** From *condensare* is an instrument capable of collecting, or of drawing into a smaller space any scattered matter, or quality, or effect. In philosophy and in mechanics, three different instruments have obtained the name of condensers; viz. the condenser of air, the condenser of electricity, and the condenser of force.

The condenser of air, in pneumatics, is a cylinder, by means of which a considerable quantity of air may be forced into a vessel fitted for the purpose. Fig. 1 and 2, Plate XIV. Pneumatics, represent two contrivances of this sort of condenser, which differ but little from each other. They are generally made of brass or of iron. A B, fig. 1, represents a cylindrical tube, at moxt, two inches in diameter, and from 8 to 12 inches in length, or even longer. Its flat bottom B is perforated with a hole, on the outside of which, a valve, (confulting of a piece of oil skin, or rather of leather, stretched over a small flat piece of brass), is adapted, so that if any air be forced from the inside of the cylinder A B, that fluid will easily lift up the valve, and make its exit through the hole at B. But should any fiction take place within the cylinder A B, the air cannot possibility enter through the hole at B, because the valve on the outside prevents it by blocking that hole. The piston c fits the cavity of the cylinder A B pretty tightly, by means of leathers soaked in oil; and it may be moved up or down by the handle E which is fastened to its rod. This piston is perforated with a hole c d, the lower part of which is furnished with a valve d, which, when the piston is drawn upwards, will permit the air to enter the lower cavity of the cylinder; but if the piston be pushed downwards, the air which is contained in the lower cavity of the cylinder, cannot pass through the hole c d, on account of the valve at d; therefore it will come out through the hole at B. At the extremity of the cylinder, a brass or iron cap F G is screwed over the valve, allowing however a little room for its free motion. The end G of this cap is perforated quite through, and its outside is formed into a screw.

Fig. 2 represents a condensing instrument simpler than the preceding, and such indeed is at present mostly used. Neither the cylinder nor the piston of this instrument is furnished with any valve. There is a hole through the screw at the bottom B of the cylinder, and a hole at C through its side, and at about two or three inches below its upper end; the piston has no perforation.
When the condenser, fig. 1, is screwed into the aperture of a glass or metal vessel, and the piston is moved alternately up and down, it will be readily understood, that the air will be forced into the vessel to which the condenser is adapted; for when the piston is pulled upwards, that is, towards A, the air cannot enter the cylinder through the hole at B, but it can easily pass through the hole C D; and when the piston is pulled in, the air which is contained in the cavity of the cylinder, cannot go out of it through the hole C D, but it can pass through the hole at B; hence it is forced to enter the vessel to which the condenser is applied. Thus, by repeating the movements of the piston, more and more air is condensed into the vessel, until the latter is built up by the elasticity of the condensed air, or the same force pushes harder against the valve at B, that the strength of the operator is no longer able to overcome it. The condenser, fig. 2, is used exactly in the same manner; this, however, must be adapted to such vessels as are furnished with a valve within their aperture, which permits the entrance, but not the exit of the air. When the piston of this condenser is drawn towards C, a vacuum is formed in the lower part of the cylinder, until the lower part of the piston is raised above the hole C; then the air rushes through that hole, and instantly fills the cavity, &c.

These instruments are generally used for condensing the air into the air-holders of wind-guns, of certain water fountains, and other machines. By this means, the air has sometimes been condensed to such a degree, as to become fix, eight, and even more times, denser than common atmospheric air. The vessel, in that case, is said to contain respectively fix, or eight, or a greater number of atmospheres.

In a variety of philosophical experiments, substances are frequently placed in a glass vessel in which air is condensed, in order to observe its effects upon the enclosed substances. For this purpose, one of the above-mentioned condensers is affixed to a frame and apparatus, as is represented in fig. 3; and this apparatus, all together, is called a condensing engine.

C D is a brass condenser, which is worked by applying the hand to the handle Z of the piston, and by moving the latter alternately up and down, the air is forced through the brass pipe D N F into the glass receiver A B. This receiver, which must be very thick and well annealed, is fit with its smooth and flat edge upon the brass plate of the machine, which is similar to the plate of an air-pump. A thick piece of brass L M, is applied in a similar manner to the upper aperture of the glass receiver, and a slip-wire passes through a collar of leathers in this brass piece. In order to prevent the lifting up of the brass piece L M from over the glass vessel, or the latter from the plate on the frame of the machine by the force of the condensed air, two pillars of wood with a croose piece G H, likewise of wood, are annexed, for the purpose of keeping down the glass vessel, and the piece of brass L M. The croose piece G H is pressed upon L M by means of the screw-nuts on the pillars I, K. There is a gage E F, annexed to this machine, which indicates the condensation of the air within the glass vessel, and tube of communication. It consists of a strong and narrow glass tube, hermetically closed at E, and connected with the brass tube of communication at F. A small quantity of mercury fills up a short part of the cavity about the middle of the tube, and the space between the mercury and the closed end E of the tube, contains air of the usual atmospheric density. It is by the contraction of this small quantity of air, that the degree of condensation in the glass receiver is indicated; for in proportion as the air is condensed into the receiver, or tube of communication, &c., so the air between the mercury and the closed end of the gage becomes contracted more and more; and the quantity of that contraction is indicated by a scale annexed to the glass tube; for instance, if that air is, by working the machine, compressed into the half of the space it occupied at first, it shows that the air within the receiver is as dense again as it was before the working of the machine. If the air in the gage is compressed into a quarter of its original space, the air within the receiver is shown to be four times as dense as it was before the working of the machine, and so forth; the condensations in the glass receiver being inversely as the spaces occupied by the air in the extremity F of the gage. These degrees of condensation are commonly expressed by saying, that the receiver contains two, or three, or four, or more atmospheres, when the air within it is, twice, or three times, or four times, or more times, denser than the usual air of the atmosphere.

There are certain air-pumps, as those of Smeaton, of Haas and others, the construction of which renders them capable of being used for condensing, as well as for exhausting the air. See Air-pump. In certain forcing water-pumps, in fire-engines, and some other hydraulic machines, there is a vessel, in which the air is condensed by the action of the machine itself; the object of which is to produce a constant stream of water out of the engine, whilst the piston of it is moved up and down in the usual way. This vessel is called the air vessel, and often the condensing vessel, or simply the condenser. See Pumps, and Fire-engine.

The head of an alembic, wherein the vapours are condensed into a liquid, has sometimes been called the condenser of the alembic.

**Condenser of Electricity.** This is an instrument capable of collecting, or of condensing into a small space, such quantities of weak and diffused electricity, as would otherwise remain unperceived, or be insufficient to affect even the most sensitive electroscope. It was originally invented by a very distinguished philosopher, Mr. Votta of Como, and is by himself described in the 72d vol. of the Philosophical Transactions. But, since its original invention, this instrument has undergone several improvements and alterations, which we shall now describe, together with their peculiar advantages and defects.

The action of electric atmospheres is the principle which suggested the construction of this useful electrical instrument. Though the nature of these atmospheres will be treated of in the article ELECTRICITY; it will, nevertheless, be necessary to give, in this place, some idea of their action, by means of an easy experiment, in order to render the principle upon which the electrical condenser acts, manifest to the reader. Affix an electroscope of pitch-balls to an insulated metallic plate; that is, a plate of tin or brass, or other metal, having a glass handle. Communicate some electricity to it, and observe the deficiency of the electroscope. In this state, bring the electrified plate near a conductor which is not insulated, such as the wall of a room or another metallic plate, and you will find that the electroscope collapses in proportion as the electrified plate comes near to the uninsulated conductor. Remove the electrified plate, and the electroscope will diverge again, nearly as much as it did at first; which shows, that by the vicinity of the uninsulated conducting body, which could easily acquire the contrary electricity, the intensity of the electricity in the electrified plate was diminished; or, which is the same thing, the capacity of the plate for containing electricity was increased. Hence, when an insulated metallic plate is situated near another metallic plate not insulated, the
the former will thereby be enabled to absorb a much greater quantity of electricity than it otherwise would, from any source whatever; and if the electrified plate be removed from the other, then that absorbed electricity will be manifested by the divergence of the electrometer, or even by affording a spark. It naturally follows, that according as the conductor which is opposed to the insulated plate, is nearer to, or farther off, the capacity of the plate will be increased more or less. Such an insulated plate, placed upon an imperfectly insulating, or an imperfectly conducting plane, for the purpose of collecting weak and scattered electricity, was called a condenser by Mr. Volta. The reason of using an imperfectly conducting, or imperfectly insulating plane, is, that when the insulated condensing plate is placed upon it, the electricity will not pass from the latter to the former. In short, the following particulars should be attended to in the construction of this, Mr. Volta's, condenser. The metal plate should be about six inches in diameter, with the edge well rounded, and furnished with a varnished glass handle. The inferior plane must be of a very imperfectly conducting nature, such as dry marble, very dry and lightly varnished wood, a common piece of wood covered with oiled silk, or such like substance; but be its substance what it may, its surface must be very smooth, and such as to coincide as well as possible with the surface of the metal plate, viz. the receiving plate; on which account, if a marble slab be chosen for the inferior plane, it will be proper to fit the surface of the metal-receiving plate to that of the marble, by grinding one against the other.

The apparatus, consisting of the above described two planes, being properly constructed, lay the receiving plate upon the other plane, connect the former with an atmospheric conductor, not much elevated above a house, or with the vapour of boiling water, or, in short, with any weak source of electricity, such as could not be discovered by any other means, and after a certain time lift the receiving plate from over the other plane, holding it by the glass handle, and present it to an electrometer, which will be caused to diverge sufficiently to ascertain the presence and the quality of the electricity. Sometimes the receiving plate will even be able to afford a spark. Yet, in several cases, the receiving plate is electrified so slightly, as not to occasion the divergence of the most delicate electrometer. A contrivance of Mr. Cavallo, which is described in his Treatise on Electricity, (fourth edition, vol. ii. p. 265) rendered this weak state of electricity capable of affecting the electrometer in a very sensible degree. His description of this contrivance is as follows:

"I naturally thought that, for the same reason which enabled the condensing plate of Mr. Volta's apparatus, to manifest such small degrees of electricity as could not otherwise be observed, another smaller plate, or small condensing apparatus, might be employed to collect and to render sensible the weak electricity of the large metal plate. Accordingly, I constructed a small plate of about the size of a tuition, having a glass handle covered with sealing-wax; and when the large metal plate seemed to be electrified so weakly as not to affect an electrometer sensibly, I placed the small plate upon the inferior plane, and touched it with the edge of the large plate; then, after removing the large plate, I took up the small one from the plane, holding it by the extremity of the glass handle, and presented it to the electrometer, which generally was so much affected by it as to diverge to its utmost limits.

"In this manner I have often obtained electricity, more than sufficient to ascertain its quality, from a single stroke of the corner of a handkerchief; viz. the large plate being laid upon the proper plane, was furred once with the handkerchief; then, being removed and presented to an electrometer, it appeared not electrified; but by touching the small plate with the edge of it, that small plate acquired thereby electricity sufficient to make an electrometer diverge."
the lower apertures of the tin tubes, and also in the wood in bottom of the frame or machine, at E and F, so that the tin plate, ABCD, is supported by those glass blocks in a vertical position, and is exceedingly well insulated. GHILKM and NOPV, are two frames of wood, which being fastened to the bottom boards, by means of brass hinges, may be placed so as to stand in an upright position and parallel to the tin plate, as shown in fig. 4, or they may be opened, and laid upon the table which supports the instrument, as shown in fig. 5. The inward surfaces of those frames from their middle upwards are covered with gilt paper, X, Y; but it would be better to cover them with tin plates, hammer very flat. When the lateral frames stand upright, they do not touch the tin plate; but they stand at about one-fifth part of an inch above. They are also a little shorter than the tin plate, in order that they may not touch the tin tubes, AD, BC. In the middle of the upper part of each lateral frame is a small flat piece of wood, S and T, with a brass hook; the use of which is to hold up the frames without the danger of their falling down when not required, and at the same time they prevent their coming nearer to the tin plate than the proper limits. It is evident that when the instrument stands as shown in fig. 4, the gilt surface of the paper, X, Y, which covers the sides of the lateral frames stands contiguous and parallel to the tin plate."

"When the instrument is to be used, it must be placed upon a window, a table, or other convenient support, a bottle electrometer is placed near it, and is connected, by means of a wire, with one of the tin tubes, AD, EC; and by another conducting communication the tin plate must be connected with the electrified substance, the electricity of which is required to be collected on the plate, ABCD: thus, for instance, if it be required to collect the electricity of the rain, or of the air, the instrument being placed near a window, a long wire must be put with one extremity into the aperture, A or B, of one of the tin tubes, and with the other extremity projecting out of the window. If it be required to collect the electricity produced by evaporation, a small tin pan, having a wire or foot of about six inches in length, must be put upon one of the tin tubes; so that the pan may stand about two or three inches above the instrument. A lighted coal is then put into the pan, and a few drops of water poured upon it, will produce the desired effect."

"The quantity of electricity, which the tin plate, ABCD, is capable of collecting, principally depends on three circumstances, viz. 1st. On the distance between the tin plate and the conducting lateral surfaces: the smaller that distance is, the greater being the collecting power; 2dly. On the size of the instrument; and 3dly. On the quantity of electricity posseffed by the body from which it must be collected or taken away."

"I need not expatiate on the principle upon which the action of this instrument depends; this being the same as that of the electrophorus of Mr. Volta's conductor, and of many other electrical experiments; namely, that a body has a much greater capacity for holding electricity, when its surface is contiguous to a conductor which can easily acquire the contrary electricity, than when it stands not in that situation."

Though this original conductor, which, by way of description, its inventor called a collector, answers the purpose for which it was intended perfectly well; yet for the common run of experiments, its size may be dispensed with, as it takes up too much room on the table of an electrician. On this account, not only the size of the instrument has been reduced, but its shape also has been varied according to the fancy of almost every philosophical instrument maker. For the sake of simplification in the condensers which are at present in general use, one conducting plane only is opposed to the receiving plate, which answers the purpose sufficiently well; for if the electricity collected by the receiving plate happens to be too weak to affect the electrometer, a smaller condenser may be used, which will condense the electricity of the former, &c.

The forms of the condensers that are mostly used at present, are represented in figs. 6, 7, 8, and 9. Fig. 6 exhibits a vertical section of the condenser constructed by Mr. John Read of Knights-bridge; aa is a circular flat plate of tin, about eight inches in diameter, standing upright, by means of the glass block f, on the wooden plate g; gb is a hollow brass cylinder, terminating in the hollow brass cone ecb; and to this cone the flat perforated brass plate bcb is affixed. The glass block f, which, by means of a brass ferrule, is fastened to the plate aa, has its lower extremity cemented in a cylindrical piece of wood, and this piece of wood is fixed in the bottom g. Now it will be easily perceived, by inspecting the figure, that the hollow cylinder bg may be moved up or down by sliding it upon the cylindrical piece of wood; and that, by fixing the plate bcb may be brought near to, or removed from the plate aa, which is the receiving plate of this condenser: i is a milled-head screw, which serves to fix the plate bb at a proper distance from aa, where a flap is made for that purpose; when i is loosened, the plate bb, with b, which is all one piece, falls in the situation represented in the figure, and in that state an electrometer is put in contact with the plate aa, in order to manifest the electricity which aa condenses while bcb is moved near it.

Fig. 7 represents a condenser of another form, as made by Mr. Cuthbertson. This form of condenser is both simple in its construction, and commodious in practice; ab is a brass plate of about 8 inches in diameter (the instrument being shown in profile), which is screwed tight into the wooden head e, which is cemented on the glass block d, and this is cemented with its lower extremity into the wooden stand ee of the instrument; if is a similar plate of brass, flattened to the brass head and pillar g; the lower part of which turns round a pin at h, so that it may either stand upright, or it may be inclined after the manner of the dotted representation in. It is almost superfluous to add, that ab is the receiving plate of this condenser. Fig. 8 shows a front view of a condenser of this form, placed close to a gold leaf electrometer, furnished with a smaller condenser, viz. such as is represented by itself in fig. 9. The small condenser, fig. 9, is similar to the one represented in fig. 7; having in fig. 9 the receiving plate is affixed to the cap of a gold-leaf electrometer; so that this apparatus, viz. fig. 9, may be used by itself in most experiments; but in certain cases it will be necessary to employ the condenser fig. 7 first, and afterwards the electricity may be farther condensed by means of the apparatus fig. 9, as shown in fig. 8.

There is an instrument contrived by Mr. Wilson, which he calls 'a compound electrical instrument for condensing and doubling.' But as the construction, as well as the principal use of that instrument properly belongs to another class of electrical instruments, its description will be found in another part of this work. See Doubler, and Multiplier of electricity.

Condenser of forces. This name was given by Mr. R. Prony to a contrivance for obtaining the greatest possible effect from a flat mover, the energy of which is subject to augmentation
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augmentation or diminution within certain limits; and in general to vary at pleasure the resistance to which the effort of the first mover forms an equilibrium in any machine whatever, without changing any part of their construction. (Bulletin of the Philomathic Society at Paris, No. 83.)

The general problem in mechanics, of which this condenser is intended as a practical solution, is enunciated by Mr. Proy in the following terms:

"Any machine being constructed, to find, without making any change in the construction, a means of transmitting to it the action of the first mover, by fulfilling the following conditions; viz."

"1. That it may be possible at pleasure, and with great speed and facility, to vary the resistance (against which the effort of the first mover must continually make an equilibrium) in limits of any required extent.

"2. That the resistance, being once regulated, shall be rigorously constant until the moment when it is thought proper to increase or diminish the fame."

"3. That in the most sudden variations of which the effort of the first mover may be capable, the variation in velocity of the machine shall never undergo a solution of continuity."

Mr. Proy applies this solution of this problem to the dynamic effect of wind; but it will be easy to make the same general, when other first movers are used. Fig. 10 (Plate XVI. Mechanics) represents the plan, and fig. 11 the elevation of the machine. OQ is the vertical arbor to which windmills are adapted; eces is an assembly of carpentry, of which one of the radii, OQ, bears a curved piece bd, of iron or steel; vertical axes of rotation aqa, being placed round the axis OQ; they also divide the circumference in which they are found, into equal parts. Each of these axes carries a curve af, of iron, steel, or copper; so situated, that when the wind acts upon the sails, the curve bd presses against one of the curves af, and causes the vertical axis to which this last curve is affixed, to make a portion of a revolution. The curves bd, and af, must be so disposed, that when bd ceases to press on one of the curves af, it shall at the same instant begin to act upon the following curve: the number of axes which are provided with these curves, must be determined by the particular circumstances of each case, and it is also practicable to substitute, instead of bd, a portion of a toothed wheel having its centre in the axis OQ, and to place portions of pinsions instead of the curves af; but the dispositions represented in the figure are preferable. Each of the axes aaaa (which are all fitted up alike, though, for the sake of clearness, only one of them has its apparatus represented in the drawing), carries upon it a drum or pulley, ttrr, on which is wound a cord that passes over a pulley p, and serves to support a weight Q, by means of the lever FG, upon which this weight may be silded and fastened at different distances from the point of motion G. The same axes, a, a, pass through the pinsions q, q, to which they are not fixed; but these pinsions carry clicks or ratchets, which bear against rr; so that when the weight Q tends to rife, the ratchet gives way, and no other effort is produced on the pinsions q, q, either by the motion of the axis or of the drum ttrr, excepting that which causes the ascent of the weight q. But the moment that the curve, or tooth bd, ceases to bear against one of the curves af, after having caused the corresponding weight Q to rife, that weight Q tends to re-descend, and then the toothed wheel rr acts against the ratchet, so that Q cannot descend without turning the pinion qq along with the drum ttrr. The pinion q q takes in the wheel ab, from

The motion of which the useful effect of the machine immediately results; so that the effect of the descent of one of the weights Q is to solicit the wheel A B to motion, or to continue the motion in concurrence with all the other weights Q, which descend at the same time. This wheel, A B, carries beneath it oblique or bevelled teeth, GD, which take in a like wheel, CE, and cause the buckets at S to rife.

From the preceding description, it is seen that the machine being supposed to start from a state of repose, the wind will at first raise a number of weights Qs, sufficient to put the machine into motion, and will continue to raise new weights, whilst those before raised are fallen, so that the motion once impressed will be continued.

Among the numerous advantages of this new mechanism, the following may be remarked:

1. No violent shock can take place in any part of the mechanism.
2. The useful effect being proportional to the number of weights Qs, which descend at the same time, this effect will increase in proportion as the wind becomes stronger, and causes the sails to turn with greater velocity.
3. The weights, Qs, being moveable along the levers FG, it will always be very easy to place them in such a manner as to obtain that ratio of the effort of the first mover to the resistance, which will produce the maximum of effect.
4. From this property it results, that advantage may be taken of the weakest breezes of wind, and to obtain a certain product in circumstances under which all other windmills are in a state of absolute inactivity. This advantage is of great importance, particularly with regard to agriculture: the windmills employed for watering lands, are sometimes inactive for several days, and this inconvenience is more particularly felt in times of drought. A machine capable of moving with the lightest breeze, must, therefore, offer the most valuable advantages.

CONDENSING of Wines. See Wines.

CONDEON, in Geography, a town of France, in the department of the Charente; 25 miles S.E. of Saintes.

CONDER, a river of England, in the county of Lancaster, which runs into the Irish sea; 3 miles S. of Lancaster.

CONDERCUM, in Ancient Geography, a station of Britain on the line of Severus's wall at Benwell hill, where the prefect of the first wing of the Aet was placed. Not. Imp.

CONDERS, from the Fr. Condire, to conduct; persons who were employed in the fishery to give notice where shoals of herrings were palling; otherwise called Ballers; which see.

CONDESCENSION, in Ethics, denotes that species of benevolence, which judiciously disregards the supposed advantages of birth, title, or station, in order to accommodate itself to the state of an inferior, and diminish the restraint which the apparent difference is calculated to produce. Accordingly, it greatly enhances the value of every other species of benevolence.

CONDESUYOS DE AREQUIPA, in Geography, a jurisdiction of South America, under the bishop of Arequipa, 30 leagues distant from that city; which extends about 30 leagues, with different temperatures of the air, and consequently produces grains and fruits. In this jurisdiction is bred the wild cochinch, with which the Indians carry on a kind of trade with the provinces in which the woollen manufactures flourish. They first pulverize the cochinch by grinding it, and after mixing four ounces of it with twelve of violet maize, they form it into square cakes called Y y mangoes.
"mango," each weighing four ounces, and sold for a dollar per pound. This country abounds in gold and silver mines, which have of late been much neglected.

CONDITTA, a town of France, in the department of the 
fruits of Calais, and district of Boulogne; 2 miles N. 
of Boulogne.

CONDICA, in Ancient Geography, a town of Asia Minor, 
in Lydia, and in the country called Mysia, according to 
Plutarch.

CONDIGNITY, Merit of, in Theology. See ME-

CONDGRAMMA, in Ancient Geography, a small town of 
Asia, on this side the mouth of the Indus, upon the coast 
of Gedroia, according to Pliny.

CONDILLAC, Stephen Bonnet de, in Biography, a 
French metaphysician, member of the Academy, and suc-
pessor to the infant Don Ferdinand, prince of Parma, an honour 
where he arrived from the highest reputation that he gained 
from his writings. The work by which he was best known 
was an "Essay on the Origin of Human Knowledge," in 2 
vols., published in 1745; in which he endeavors to develop 
the faculties of the mind, by giving a sort of historical ac-
count of its several functions. In 1754, he gave to the world 
a "Treatise on Sentiments," in 2 vols., 12mo: here he con-
siders what would be the conceptions of a robot, provided 
at first with a single sense, and successively with the others; 
and hence he undertakes to account for the origin of me-
memy, judgment, and the mental affections; and the gradual 
formation and correction of foolish ideas. In the course of 
the following year he published a "Treatise on Animals," 
in which he refutes the notions of Descartes and Buffon con-
cerning the merely mechanical nature of brutes, and shows 
in what manner their faculties are acquired. In 1756 his great 
work, entitled, "A Course of Study drawn up for the 
Instructio of the Prince of Parma," was published in 16 vols., 
12mo. As an introduction to these volumes, we have a dis-
course on the different modes of communicating instruction: 
giving a decided preference to the gradual advance from par-
ticular facts up to general principles, instead of the contrary 
method. Metaphysical lectures, logic, and the philosophy 
of the human mind, are among the earliest parts of this course 
of study; and from these, as preliminary steps, he proceeds 
to the study of history, of which he has given an ample and 
well-arranged abridgment, in seven volumes. As an appen-
dix, is added a volume consisting chiefly of political reac-
tions. This ingenious writer published also a final work, 
etitled, "Commerce and Government considered relatively 
to each other." In all his works he exhibits an extensive 
knowledge, a mind well imbued with the principles of hu-
manity, and with the most liberal notions of government. 
He died in the year 1780, highly respected by his country-
men, and characterized for the founders of his judgment, 
for the clearness of his ideas on every subject which he under-
took to discuss, and for his general knowledge in almost every 
department of literature. Nouv. Dict Hill.

CONDITION, in the Civil Laws, an article of a treaty, 
or contract; or a clause, charge, or obligation, stipulated 
in a contract, or added in a donation, legacy, testament, 
&c.

The donee does not lose his domative, if it be charged 
with any dishonest or impossible conditions. Lawyers dis-
inguished three kinds of conditions, under which a legacy or do-
nation may be made: these are the conditional, which depends 
merely on chance; the potestative, which is absolutely in our 
power; and the mixed condition, which is both casual and po-
tentive together.

CONDITION, in Common Law, is a manner, quality, 
or restriction, annexed to an act; qualifying or suspending 
the same, and making it precarious and uncertain, whether 
or not it shall take effect.

Accordingly, it is defined to be what is referred to an 
uncertain chance, which may not may not happen. Or, con-
dition is a modifier, or quality, annexed by him that hath 
the estate, interest, or right to the land, &c. whereby an estate, 
&c. may be either created, defeated, or enlarged upon an 
uncertain event; and it differs from a limitation (which &c.), 
which marks the bounds or compacts of an estate, or the time 
how long the estate shall continue.

A condition is also considered as one of the terms upon 
which a grant may be made; and in this sense a condition in a 
deed is a clause of contingency, on the happening of which 
the estate granted may be defeated; as "provided always, 
that if the mortgagee shall pay the mortgagee 500l. upon 
such a day, the whole estate granted shall determine;" and 
the like.

Of conditions there are various kinds; viz. conditions 
in deed or express, and in law or implied; conditions prece-
dent and subsequent; conditions inherent, and collateral, 
&c.

CONDITION in deed, or express, is annexed by express 
words to the femdiment, lease, or grant, either in writing, or 
without. As, if a man make a lease of lands to another, 
reserving a rent to be paid at such a feast; upon condition, 
if the lessee fall in payment, it shall be lawful for the lessor 
to re-enter.

CONDITION implied, called also condition in law, is when a 
man grants to another the office of a steward, bailiff, keeper 
of a park, &c. for life; though there be no condition ex-
pressed in the grant, yet the law makes one covertly; which 
is, that if the grantee do not duly execute all things be-
longing to the office, it shall be lawful for the grantor to di-
charge him.

CONDITION precedent, is when a lease or estate is granted 
to a person for life, upon condition of the payment of a cer-
tain sum by the lessee to the lessor at a certain day, when he 
shall have a certain sum on such a day, or that his estate shall 
expire: so that here the condition follows the estate, and 
the performance precedes it. From these definitions it ap-
ppears, that a condition precedent gets or gains the thing or 
estate made upon condition by the performance of it; and 
that a condition subsequent keeps and continues the estate 
by the performance of the condition. If one agree with an-
other to do such an act, and for the doing of it the other 
shall pay so much money; here the doing of the act is a 
condition precedent to the payment of the money, and 
the party shall not be compelled to pay till the act is done; 
but when a day is appointed for the payment of money, 
which day happens before the thing contracted for can be 
performed, there the money may be recovered before the 
thing is done; for here it appears, that the party did not 
intend to make the performance of the thing a condition 
precedent. For a further account of these conditions, see the 
article Estate upon condition. There are other conditions, 
besides those already mentioned: such are conditions inher-
tent, being such as depend on the heir with the land grant-
ed; and collateral conditions, being that which is annexed 
to any collateral act. Conditions are likewise affirmative, 
which consist of doing; negative, which consist of not doing: 

some
some are said to be refractory, for not doing a thing, and some compulsory, as that the lessor shall pay the rent, &c. Some conditions are fugitive, to do one thing only; some compulsory, to do divers things; and others dependent, where one thing of several is required to be done. Co. Litt. 207.

Conditions in restraint of Marriage, have not been generally favoured, as contrary to found policy; but where a legacy has been given over to another, the condition has been held void; and it seems, that such conditions as only reasonably restrain children from imprudent marriage will be always supported—that is, when they operate only as particular, not as universal restrictions. Where a legacy is given on consideration that the legatee shall not marry without consent, and there is no devise over, the condition is void. 4 Burr. 2055. Com. Rep. 759. The rule of the ecclesiastical law is, that where a portion is given in consideration that the daughter should not marry, the condition is void. As the intent of the tellator chiefly governs in wills, such construction is always made of the words, as will best support his intent; and therefore these words ad faciendum, fieri nondum, &c. in a will create a condition. Co. Litt. 264 a. A grant to one to the intent he shall do to and fo, is no condition, but a trust and confidence. Some words in a lease do not make a condition but a covenant, upon which the lessor may bring his action. A covenant not to grant, fall, &c. may be a condition; and covenant, that, paying the rent, the lessor shall enjoy the land, is conditional. 2 Danv. 2. 6. Where words are indefinite, and proper to defeat an estate, they shall be taken to have the force of a condition. Palm. 503. For the performance of conditions and relief against the breach of them, see Jacob's Dict. by Tomlins, art. Condition.

Condition of a Bond. See Bond.

Condition without which, sine qua non, is used in Philosophy, in speaking of some accident or circumstance, which is not essential to the thing, but is yet necessary to its production. Thus, light is a condition without which a man cannot see objects, though he have good eyes; and thus fire, though considered in itself, may burn without wood; yet is its presence a condition without which the wood cannot be burnt.

Condition, applied to Horses, is used to signify that a horse is well fed and of good appearance; it also has another signification, that of his being brought by suitable treatment into a state of body, that gives him the fullest advantage of all his faculties in performing any very difficult or arduous exertion or exercice, as for hunting, racing, trotting, or the arts of the manage.

A horse that is moderately fat may be said to be in good condition, and so he is for sale, or for slow heavy draught-service; but such a one would be totally out of condition for any of the above exercises. To condition a horse for these a proper share of clean nourishing food and exercice is necessary, as much only as would confer the utmost point of strength and power, without adding any unprofitable insemination of matter to the body that might clog the freedom of respiration, or increase the weight and bulk of the animal, and impede rather than assist the functions of the organs, vifera, and limbs. This art, if properly understood, should impart the greatest facility of wind, and join to lightness of the body the greatest possible elasticity and strength of the muscular system. Such is properly the art of training, to which we refer the reader, and in which, though great things have been done, more wonderful might be yet effected; if to a well founded view of nature in these animals was added all that concomitant and well-placed art could bring to her aff mammal, for nature we are led to believe has been but too often thwarted instead of assisted by the arts of artful men, jockies, and smiths.

Though mere practice alone will teach much, yet when combined with a just system or knowledge of cause and effect, the art, whatever it be, may be carried to much higher perfection than it can otherwise.

For the present, we only treat of condition in horses, for the common and ordinary purposes to which they are applied.

To artful servants is left in general the phyficking, dieting, and conditioning the horse; and a mystery has often, with the ignorant, more charms than the clear face of truth herself. The effects of drugs upon horses are very little known. Perhaps, except the purgative effect of aloes, and the diuretic effect of foops and purgatives, and neutral salts; we have scarcely any medicine whose effects we really know upon the horse, or that appears at present likely to be known, yet are grooms ever phyticking their horses with fome drugs or other; good clean food in plenty, dry lofty stables, gentle exercice, and attention to the skin in keeping it clean, will bring almost any horse that is out of condition into condition, unless there be some lurking disease; yet native drugs are added to their food, and they are pleased to fancy that the effects they experience result from these, though it is more probably as far as they go, and in the uncertain and often idle doses in which they are administered, that they prevent, rather than affift, the purpose they have in view, and rather disturb their digestion, and weaken the stomach, than affift it; or more certainly render nauseous and loathsome the fome they could otherwise relish; antimony, nitre, brimifone, elecampane root, &c. are among their fecrets for this purpose. Antimony is, however, believed, by better judges than these, to affift the skin of the horse, and promote perpiration; this it may possibly do. We may, how- ever, juft remark, that where it affects the skin, it has the power of affecting the stomach; but with pigs, horses, and a variety of other animals, it does not affect the one, and one should doubt whether, in these cafes, it would affect the other; for in no quantity whatever, and we have given 4 oz. at a dose, does it appear to affect the stomach; nitre in larger quantities than they are used to give, will increase the urine; but how this promotes condition, we have not yet been informed. The rest of their nostrums are obvi- ously inexact, at least their actual effects, when pulped, till they become externally visible, have never been exhibited; and unless we are, we cannot know them. There is, how- ever, another, and a more certain purpose answered, in the administration of their drugs, and to which the science of medicine, in ignorant hands, is but too frequently made subservient; and without which, we believe, there would not be so much anxiety about the administration of them.

There is one influence, however, in which we rejoice to have it in our power to concur with these men in the use of medicine, and that is on horses coming from grafts; this appears to be a really useful practice, and we think, from sufficient experience, we can vouch for the fact, though to give medicines witho a direct indication for their use, would at first appear repugnant to reason, yet it is usual with grooms to give one, two, or more doses of physic, on the horse being brought from grafts "to clear him out," as they say; but if such were the only effect, there would be no occasion for it, as the grafts would very naturally come away from him without its good effects: we shall give a different account of the sudden change of life, from green relaxing watery food, as grafts, to dry hay and stimulating corn; from free open air and nightly dews, and all kinds of weather, to a close...
clef, low, foul, and crowded flable, the air of which is heated to an excess, and filled with stimulating exhalations from the dung; the water which had been received in quantities untrained, is now portioned out (though it is really more necessary) in miserable pittances. The body, before exposed, is wrapped in rugs and cloths, and the whole system becomes heated and inflamed by the sudden changes, inflammatory complaints of the lungs, eyes, palate, throat, intestines and feet, are produced; and it is therefore useless on this account, in keeping off these attacks, to lower the habit by physic, after the horse has been a few days in the stable, and to pass by flow degree to the excessive use of these vigorous stimulants. Dealers like to mix carrots with their corn, and bleed occasionally, and give bran malices, which has the same effect.

In turning out also, grooves are again for physicling their horses, and under the same pretence of clearing them out, and preparing them for grafts. They will, however, be sufficiently lowered and reduced by the grafts itself, without any additional reduction by physic. It may not be an useless precaution, however, to withdraw by degrees the use of corn, previous to turning out, and the removing all sort of clothing, to give water in greater abundance, that the change may not be too suddenly felt, and bring on break wind, farcy, and the diæseis induced by too great debility.

In Arabia, where the finest horses of the world are produced, a late traveller in those countries, (Mr. Barker), informs us of the extraordinary simplicity of their treatment of them. They do not use any instrument for drenching or cleaning them. They merely fallen them to a picket by the leg or a halter, to give them their food, which, during the spring affords us of grafs; and when the earth no longer produces that nutriment, they supply the want by camel's milk, which, he says, is most allur'd preferable to any kind of grain.

Beans, malt, oats, clover, hay, and meadow hay, are the general food of horses in England, and are suppos'd to be stimulant or invigorating to the system of the horse, in the order in which we have placed them. Barley was the ancient food for horses, the discovery of oats being comparatively of modern date.

In the north of Holland, they feed their horses principally on the black four bread called bumpernickle, made of buck wheat, and there it is eaten also by a large share of the inhabitants; for this purpose, they alight from their vehicles, and, without taking the horses out of their hempen traces, cut it in flakes, and give them to eat. We observed that they appeared relaxed by it, but apparently without much debilitating them, as they seem'd to do their work very well.

In the "Museum Rusticum" is a proposition founded apparently on actual experiment of feeding horses on carrots, vol. i. p. 333. The following remarks we think worth recording from that communication: "I have a couple of hunters which I value as being very good horses, and these I feed in the feaon with very little else besides carrots well cleaned from the dirt, and leaves made of the meal of barley and oats, mixed sometimes with a small admixture of coarse but good wheat meal; and if they require to be loosen'd in their bodies, I now and then give them some bran. As to hay, they eat at this seasion but little of it. of oats none at all, yet they go through their work to admiration."

Furze or whins has been found useful food in fattaining horses, after it has been bruised, and the thorns or prickles shredded; this some horses will naturally do with their feet. Dr. Darwin relates, that on one particular common, all the horses do it; and that fresh comes flave, till by imitation they learn this practice, as the common, in other respects, is very barren. In Wales, mills, we understand, have been used for crushing the furze for cattle.

Salt is imagined an useful addition to the food of horses. Salt malices have often a preference given them over other ground for horses and cattle; whether it is the salt that in itself operates bencicially, or whether the herbage itself is altered by it, and is rendered more salutary to the cattle, is not known. The same correpsondent, in the "Museum Rusticum," says that salt is supplied is abundantly distributed in the mountains by the Swifs, for the use of their cattle and horses, who become excessively fond of it, and more healthy in consequence; it is conceived to be an antidote to worms and other formations in the body, and the long continued use of it to cure them when formed, vol. i. p. 92.

Horses, he observes, are fond of it with their oats.

Horses when at liberty are almost ever feeding; therefore long fasting must be injurious to the stomach, and should be as much as possible avoided; they would also naturally, there is reason to believe, feed principally during the night, and sleep during the day; their sleep, however, is hardly ever, in health, profound and fast, but is a state of watchful dozing.

Horses are naturally gregarious, and though they will do very well alone, company, where there is an opportunity for it, is preferable for their health. The stable should be lofty, so as to confine an atmosphere about them, loaded with exhalations from their own bodies and their dung: the loftiness alone of the stable is their best airing; all partial draughts from doors, windows, or holes into the left; as far as they effect them, are injurious; for we have often remarked, that though they bear the coldest weather of our seasons with turn out, yet they easily take cold from partial draughts in stables, inasmuch, that persons not attentive to these effects would hardly believe their facility.

In cleaning the skin, the curry-comb is considered as a necessary implement. In warmer climates, where the scurf comes away more freely, this instrument is not so much used; and here it is often used to horses whose skins are particularly thin and sensitive, yet the difference is made; and though the animal expresses, in every way he can, the excessive torture it occasions, yet it is perfir'd in, and violence is often had recourse to, to enforce it, and horses are thus rendered vicious and untractable. Where this is found to be the case, it would fave much trouble and inconvenience to use a milder kind of comb, or to lay it aside altogether, and use a light brush made for the purpose. It is more easy by violence and punishment to create vice, than to overcome a natural dislike by it.

Warm clothing, on account of its keeping up a free perspiration, tends to render the skin cleaner, makes the coat lie better, and have a more glossy appearance, and saves trouble. It is too often, however, carried to an excess, and two or three hot rugs keep the horse in a perpetual fever; and as they are all taken off, when he is most exposed, on going out, the sudden check given to the perspiration by the elements without, lays the foundation of disease, and occasions inflammations of the lungs, cataracts, and coughs, that might as well be avoided by more moderate and judicious proceedings, besides the weakening effects of such violent perspirations. There
There is a principle in feeding them that ought not to be overlooked; which is, that good food may be carried too far, till, instead of condition, it produces fever and distemper, and destroys the condition it is meant to promote. Green vegetable food fills out the body; and from its weight and watery nature weighs down the abdomen, giving an ungainly appearance. Some horses, however, can work with this, that more stimulating food does not suit so well. The dry diet braces the fyltem, and draws up the abdomen. The food is least imbibed in the large intestines, which occasions the flanks to appear full and rounded, and greatly adds to the beauty of the horse's make in these parts.

Some horses we have noticed have voracious appetites, and devour great abundance of corn, and whatever is set before them, yet always look meagre and out of condition. When this has been the case, we have been led to believe that by too much food, and of too heating a quality, the stomach and intestines have been paralysed, and lost their powers of forming chyle, or absorbing it. Turning out to the green pastures will often bring them into condition, and they fall off again in the flable. Horses of small make and fiery temper are, we have thought, more particularly subject to this disease.

Water, like the food, should be given often, and not in too large quantities: feeding horses is a dangerous cullom; it induces them, where there is an opportunity to take enough at once, to break their wind, or otherwise injure themselves. See art. Broken Wind.

The skin, to look well and healthy, should be smooth, supple, and easy upon the muscles, free from knots, and by no means tight about the ribs. The hair clean, bright, and glossy, lying to the skin, and not disordered, or turning away from it, or twisted, dry, or thirsty. The effects of cold air on the skin of the horse, in setting up the hair, is well known to the grooms, who cautiously avoid it.

Exercise to animals by nature born to be fleet, is particularly necessary; besides the good it does in moving and forwarding all the secretions and excretions. This should be gentle or vigorous, proportioned to the strength and state of the horse, without distressing or too much fatiguing him. A gentle perspiration loosens the fur, and makes him clean better.

The hide soon gets foul, and a groom that has much pride in the appearance of his horse, is almost incessantly curry ing, brushing, and hard rubbing the coat.

It is a customary thing with the dealers in horses, in forming a judgment of the actual state of the horse, and whether his condition will admit of farther advancement, to handle the crest, or upper part of the neck which carries the mane; if this be lax in the hand, and easily plant, it is presumed the condition may be carried farther; if, on the contrary, this part has a stiff tense feel, it is considered that farther improvement is not to be expected. Among the acknowledged indications also of poverty and good condition, is the poor mark in the buttack, that is the channel, or depression running down the buttack, at its posterior part; being a depression formed between the muscles. If this channel is very visible and deep, the horse is out of condition; if obliterated, so as to be hardly visible, he is considered in condition.

Blood horses are more easily cleaned than the common kind of horses; their coat is not so thick, it does not retain the perspiration so much, and the hair takes a better polish; which makes an experienced groom always prefer them.

Too great excitement from the food, and undue fever, may be known by the heat of the mouth, the fulness of the veins of the eyes, the strength of the pulse, and diminished appetite; the skin also, and extremities, are found too hot or too cold, languid and weakens: the remedies are before stated.

CONDITIONAL, something not absolute, but subject to limitation.

Conditional legacies are not due till the conditions are accomplished.

The Arminian divines maintain, that all the decrees of God, relating to the salvation and damnation of men, are truly conditional; and the Calvinists, that they are all absolute. See Arminian, &c.

Conditional conjunctures, in Grammar, are those which serve to make propositions conditional. As, if, unless, provided that, in case of, &c.

Mr. Horne Tooke, in his "Tracts, &c.," has given us a new fyltem, with regard to these conditionals, as well as other conjunctures. Our conjunction if, he says, is merely a verb; being the imperative of the Gothic and Anglo-Saxon verb tifer, tifan, tisan. And in those languages, as well as in the English formerly, this supposed conjunction was pronounced and written as the common imperative, purely tifer, tifan, gif. In proof of the truth of this etymology of the word if, the author observes, that when the datum upon which any conclusion depends, is a sentence, the article that, if not expressed, is always understood, and may be inferred after if. But the article that is not understood, and cannot be inferred after if, where the datum is not a sentence, but some noun governed by the verb if or give. This, he says, will hold universally, not only with if; but with many other supposed conjunctions, such as, but that, unless that, though that, left that, &c. which are really verbs, put in this manner before the article that. An, now indeed obsolete, but formerly often used to supply the place of if, is also a verb; being nothing else but the imperative of the Anglo-Saxon verb dean, which likewise means to give or grant. If recourse should be had for confuting the author's opinion to the conditionals of the Greek and Latin, and Irish, the French, Italian, Spanish, Portuguese, and many other languages, he obviates the objection by alleging, that those words which are called conditional conjunctures, are to be accounted for in all languages in the same manner as he has accounted for if and an. Not that they must all mean precisely as these two do—give and grant; but some word equivalent: such as, be it, buffet, allow, permit, put, suffer, &c.; which meaning is to be sought for from the particular etymology of each respective language. To put this matter of doubt, he says, "I mean to discard all supposed meaning, not only about these conditionals, but about all those words also which Mr. Harris and others distinguish from prepositions, and call conjunctures of finiences. I deny them to be a separate sort of words or part of speech by themselves. For they have not a separate manner of signification; although they are not devoid of signification. And the particular signification of each must be sought for amongst the other parts of speech, by the help of the particular etymology of each respective language. By such means alone can we clear away the obscurity and errors in which grammarians and philosophers have been involved by the corruption of some common words, and the ugly abbreviations of construction." See Conjunction.

Conditional propositions, in Logic are such as consist of two parts, connected together by a conditional particle. Of these, the first, wherein the condition lies, is called the antecedent, and the other the consequent.

Thus, "if the soul be spiritual, it is immortal," is a conditional
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conditonal proposition, wherein, "if the soul, &c. is the antecedent, and "is immortal" the consequent.

The truth of these propositions depends on the truth of the connection of them, and they may be properly denied or contradicted when the negation affects their conjunctive particles. See Proposition.

Conditional falsity, is that whose major or minor, or both, are conditional propositions: e. gr. "If there be a God, the world is governed by Providence; but there is a God, therefore the world is governed by Providence." See Syllogism.

Conditional etale, fees, pardons, and regisfations. See the subjunctives.

Conditionals, science of, i.e. of conditional truths, imports that knowledge which God has of things, considered, not according to their essence, their nature, or their real existence; but under a certain proposition, which imports a condition never to be accomplished.

Some of the scholmen deny, that God has the knowledge of conditionals: the Thomists maintain, that God's knowledge of conditionals depends on a predetermining decree; others deny it.

F. Daniel observes, that the truths which compose the knowledge of conditionals, being very different from those which compose the knowledge of intuition, and that of understanding; a third class must be added, and the knowledge of God be divided into intuitive, intellective, and conditional. See Knowledge.

CONDIVI, Ascanio, in Biography, an artit whose works of painting and sculpture are now unknown. He is indeed said to have polished but an humble share of talent, infomuch that although he had the good fortune to be the inmate and disciple of the great Michelangelo Buonarroti for many years, he never attained eminence.

The world however has obligations to Condivi for the life which he wrote of his master, in somewhat the form of a journal, and which he published in 1553, ten years prior to the death of Michelangelo. Mr. Mariette, the celebrated connoisseur, was decidedly of opinion that the greater part of this narrative was written absolutely under the immediate influence and guidance of Michelangelo himself, and of course considered it as infinitely more authentic than the florid, but halit, composition of Vafari. Vafari had published a life of the great Florentine artit in his first edition of 1552. Condivi points out and corrects many of his errors. This Vafari indignantly retells in his second edition of 1568, but as Michelangelo was then no longer alive to decide their respective claims, the veracity of Condivi should suffer no imputation. Vafari however relates many things which the other omits, dwells more largely upon others, and in his second edition gives us the sequel of Michelangelo's life, with a long description of his magnificent funeral, &c. it was therefore desirable to unite these and other facttered materials into one work: this has lately been done by Mr. Duppa in a handfome quarto volume.

The first edition of Condivi is in quarto and become rare. Another edition, with copious notes by Antonfrancesco Gori and Mariette, together with extracts from Vafari, was published in Florence, 1746, in quarto.

CONDIVICUM, in Ancient Geography, Nantes, a town of Gallia Lyonnaensis, according to Ptolemy, and capital of the Nantesti, from whom it took its name.

CONDOCHATES, a river of India, on the other side of the Ganges, according to Pliny and Arrian, which discharged itself into the Ganges, about the 20th degree of latitude.

CONDOLENCE, in Ethics. See Commiseration.

CONDOM, in Geography, a town of France, in the department of the Gers, and chief place of a district, situated in a beautiful valley on the river Baise, 27 miles N.W. from Auch, and 90 S.E. from Bordeaux. It has a sub-prefect and a court of justice. The place contains 1517, and the canton 17,212 inhabitants. The territory of the canton includes 2452 kilometres and 16 communes. The whole district counts 18,8 communes and 67,126 inhabitants, upon a territorial extent of 10628 kilometres. Its soil is in general fertile, except in the southern part, which is an extensive barren beach; but as there are many salt pits, the walle land is improved with muck, which renders it tolerably fertile for a term of 20 years, at the end of which the ground is suffered to lie waste again, and another extent of land is rendered productive upon the same plan. Corn, wine, and brandy are the chief articles of trade, most of which are sent to Mont de Marsan and Bordeaux.

CONDONMOIS, a country of France, before the revolution, of which Condorn was the capital.

CONDONMA, in Zoology, the name given by Buffon to the striped antelope of Fennant, the antelope hreepicos of Gmelin's Linnaeus, the cervus espenisi, or cape deer, of Collin. Ac. Ac. Thod. Palat. 1. 457, the box hreepicos of Aldrovand, the hreepicos of Cans, Geifer, and Johnson, and the wild goat of Kolben, &c. It has long, comprefled, wrinkled, tapering, sharp-pointed spiral horns, with a ridge on one side which follows the wrinkles; the body has a white line along the back, and several white flipes across from that down the sides towards the belly and thighs. This animal inhabits the country near the Cape of Good Hope. It is near nine feet long from the nose to the rump, and four feet high at the shoulders; the body is long, slender, and of a reddish-grey colour; the face is brown, having a white line from the corner of each eye, running forwards and uniting above the nose; the transverse flipes above-mentioned are, in general, even in number, four of which point towards the thighs, and three to the belly; it has a short mane on the neck, and long hains hanging down from the throat to the breast; the breast and belly are grey; the tail, two feet in length, is brown above, white on the under side, and black at the end; the horns are of a dullish colour, and naturally wrinkled, though such as are brought to Europe are highly polished; they are near four feet long, close at the balees, above two feet and a half distant at the points, and have two spiral screw-like turns. The female has no horns. It is said to leep with surprising activity to a great height.

CONDORCET, Jean Antoine, Nicholas Caritat, Marquis de, in Biography, celebrated as a writer and political character, was descended from an ancient family in Picardy in France. He was born in 1743, and was educated at the college of Navarre, where he exhibited an ardent thirll for physical and mathematical pursuits, and acquired the reputation of a hard student. Condorcet first attracted public notice as a mathematician, by his treatise "On Integral Calculations," which he wrote when he was only twenty-two years of age, and in which he proposed to exhibit a general method of determining the finite integral of a given, differential equation, either for differences infinitely small, or finite differences. D'Alembert and Bezout, the commissioners of the academy, employed to examine the merits of this performance, declared that the greater part of the methods were of the author's own invention, that the production itself indicated a degree of knowledge very seldom to be met with at so early an age, and that it afforded a prefiguration of talents worthy of being excited by the approbation of the academy. This was followed by his "Essai on Analysis," and other works, which shewed his skill in analítica.
analytical researches. In the year 1759, he was admitted member of the Academy of Sciences, the memoirs of which were enriched by various disquisitions prefixed by him on the most abstruse subjects. During the administration of Turgot, celebrated no less for his integrity, than for his high talents, Condorcet was applied to for assistance in arranging plans for economical reforms in the state. In 1773 he was appointed secretary to the Academy of Sciences, when he composed eulogies upon several deceased members who had been neglected by Fontenelle. At this period he was the friend and intimate associate of Voltaire, D'Alembert, and other distinguished characters. Like D'Alembert he united in himself the reputation of an elegant writer, and of profound science; and in 1782 he was received into the French Academy, on which occasion he delivered a discourse concerning the influence of philosophy. In the following year he succeeded D'Alembert as secretary to that academy, and pronounced an able eulogy to the memory of his deceased friend, whose literary and scientific merits are yet forth with great ability. The death of Euler afforded Condorcet another opportunity of displaying his own talents by appreciating those of the departed mathematician. In his discourse on this occasion, he exhibited a clear and scientific statement of the improvements and inventions introduced into one department of knowledge by the exertions of an individual. The lives of Turgot and Voltaire, and the eulogy pronounced upon the death of the celebrated Franklin, were decided testimonials to the abilities of Condorcet as a biographical writer. Turgot had occupied much of his time and attention with moral and political sciences, and was particularly anxious, for the good of his fellow creatures, that the certainty of which different species of knowledge are susceptible, might be demonstrated by the assistance of calculation, hoping that the human species would necessarily make a progress towards happiness and perfection, in the same manner as it had done towards the attainment of truth. To second these views of Turgot, Condorcet undertook a work replete with geometrical knowledge. He examined the probability of an assembly's rendering a true decision, and he explained the limits to which our knowledge of future events, regulated by the laws of nature, considered as the most certain and uniform, might extend. If we do not possess a real, yet thought, we have at least a mean probability, that the law indicated by events, is the same constant law, and that it will be perpetually observed. He considered a forty-five thousandth part as the value of the rill, in the case when the consideration of a new law comes in question; and it appears, from his calculations, which we cannot go into, that an assembly confiding of 61 votes, in which it is required that there should be a plurality of nine, will fulfill this condition, provided there is a probability of each vote being equal to four-fifths, that is, that each member voting shall be deceived only once in five times. He applied these calculations to the creation of tribunals, to the forms of elections, and to the decisions of numerous assemblies; inconveniences attendant on which were exhibited by him. This work furnished a grand, and at the same time, an agreeable proof of the utility of analysis in important matters to which it had never before been applied.

Condorcet at this time started the idea of a dictionary, in which objects are to be discovered by their properties, instead of being searched for by their respective names; he also intimated a scheme for constructing tables, by which ten millions of objects might be classified together by means of only ten different modifications. The talents of Condorcet were very various, and he distinguished himself by many philosophical and economical disquisitions, which it is supposed, with great justice, had a great share in producing the subsquent important revolution in France. Without pretending to decide upon the motives of those who were active in achieving the downfall of the French monarchy, we shall bring before the reader a brief account of the part which Condorcet took in this business. Almost all his writings tended to pave the way for that most important change in government which took place in the year 1789. At this period, and in the following two or three years, he engaged in several periodical publications, with a view, no doubt, of guiding the public mind. He was a member of the popular clubs at Paris, particularly that of the Jacobins, celebrated for democratic violence, where he was a frequent but by no means a powerful speaker. He was chosen a representative for the metropolis, when the constituent assembly was diffolved, and joined himself to the Brissotin party which, in point of real talents and integrity, were not inferior to any of the contending factions of the day. But they wanted energy to control the people, and finally fell victims to that revolutionary spirit which they had excited. Condorcet at this period was the person selected from the party to draw up a plan for public instruction, which he comprehended in two elaborate and very striking memoirs; the principles laid down were, perhaps, too abstract for general use, and too refined for the present state of society. He was the author of a manifesto addressed from the French people to the powers of Europe, on the approach of war; and of a letter to Louis XVI., as president of the assembly, which was dictated in terms delitative of that respect and consideration to which the first magistrate of a great people has, as such, a just claim. Condorcet attempted also to justify the insults put upon the sovereign by the lowly, the most iliterate, and most brutal part of a delicious populace. On the trial of the king, his conduct was equivocal and unmanly; he had declared that he ought not to be arraigned, yet he had not courage to defend his opinion or justify those sentiments which he had deliberately formed in the closet.

After the death of Louis, Condorcet undertook to frame a new constitution, which was approved by the convention, but which did not meet the wishes and expectations of the nation. A new party, calling themselves the Mountain, were now gaining an ascendency in the convention over Brissot and his friends. At first the contest was severe; the debates, if tumultuous and dissipated may be so denominated, ran high, and the utmost acrimony was exercised on all sides. Condorcet always timid, always anxious to avoid danger, retired as much as possible from the scene. By this act of prudence he at first escaped the destruction which overwhelmed the party; but having written against the bloody acts of the mountain, and of the moniter Robespierre, a decree was readily obtained against him. He was arrested in July 1793, but contrived to escape from the vigilance of the officers under whose care he was placed. For nine months he lay concealed in Paris, when dreading the consequences of a domiciliary visit, he fled to the house of a friend on the plain of Mont-Rouge, who was at the time in Paris. Condorcet was obliged to pass eight and forty hours in the fields, exposed to all the wretchedness of cold, hunger, and the dread of his enemies. On the third day he obtained an interview with his friend; he, however, was too much alive to the sense of danger to admit Condorcet into his habitation, who was again obliged to seek the safety which unfrequented fields and pathless woods could afford. Wearing at length with fatigue, and want of necessary
necessary fastness, he went to a public-house, and asked
for an omelette, which he devoured with so much greediness
as to induce the suspicion of a municipal officer who was
present. At this period, suspicion and guilt were divided
by very narrow boundaries; the unfortunate man was fixed
and thrown into a dungeon, in order that he might, on the
following day, be conducted to the bloody tribunal at
Paris. The precaution was, however, unnecessary. Con-
dorcet was found dead in the morning; and as it was gen-
erally understood that he was never without a concealed
dote of the most active poison, to this cause his melancholy
end was generally ascribed. Such was the concluding scene
of the career of a man who had sustained a brilliant part on
the stage of life. He died March 25, 1794.

His character has been variously estimated. His manners
were mild, and his talents were unquestionably of the first
order. He is said to have been deficient of those fine feel-
ings which distinguished great and generous minds; and it is
allowed on all hands that he was a prey to timidity; a pas-
sion which at length induced him to commit the act of sui-
cide. By Madame Roland, his contemporary and inti-
mate, he was, in his lifetime, thus described: "The ge-
nius of Condorcet is equal to the comprehension of the
greatest truths: but he has no other characteristic besides
fear. It may be said of his understanding, combined with
his person, that it is a fine essence absorbed in cotton. The
timidity which forms the basis of his character, and which
he displays even in company, on his countenance and in his
attitudes, does not result from his frame alone, but seems to
be inherent in his soul, and his talents furnish him with no
means of furnishing it. Thus, after having deduced a prin-
ciple, or demonstrated a fact in the assembly, he would give
a vote decidedly opposite, overawed by the thunder of the
tribunes, armed with inuicts, and lavished on menaces. The
propensity of life for him was the lifeblood of the academy.
Such men should be employed to write, but never permitted
to act." Condorcet was married, and lived on the most
affectionate terms with his wife. He left one daughter,
who, has, during the present summer (1807), been married to
Arthur O'Connor.

Condorcet was the correspondent of the great Frederic,
and of Catherine, the Empress of Russia. "Letters to the
King of Prussia," he published during his life; and he
left behind him, which appeared as a most delightful work, "A
Sketch of a Historical Draught of the Human Mind." In
this work, he confides man as he has been, as he is, and as
he may be; and he inculcates, with great energy, his fa-
vourite idea of the perfectibility of the human species, and
of its advance to actual perfection. He left behind him
also "A Treatise on Calculation," and "An Elementary
Treatise on Arithmetic." His work on the human mind
was written during the months that he seduced himself
from the favage who was seeking for his blood, with more
than inhuman fury; and it is remarkable, and to the credit
of the writer, that under such circumstances, dreadfully
at every instant, he could compose so able a treatise, and
feel the conviction of the progress of his fellow creatures to-
wards moral improvement. Memoirs of the French Revo-

CONDORE, or Pulo Condore, in Geography, an
island of the East Indian ocean, about 20 leagues from the
cost of Cochin-China, taking its name from two Malay
words, Pulo signifying an island, and Condore a calabash,
of which it produces great quantities. This island is high and
mountainous, and surrounded by several smaller islands, some
of which are less than one, and others two miles distant.
It is of the form of a crescent, extending, says Capt. King,

near 8 miles from the southermost point, in a N.E. direc-
tion, and its breadth no where exceeds 2 miles. Sir Geo.
Stanton says, it is 11 or 12 miles in length, and about 3
in breadth, consisting of a ridge of peaked hills. From
the westemmost extremity, the land trends to the S.E. for about
4 miles, and opposite to this part of the coast there is an
island, called by Monf. D'Après "Little Condore," which
runs two miles in the same direction. This position of the
two islands forms a safe and commodious harbour, the
entrance into which is from the north-west. The distance
between the two opposite coasts is 3/4 of a mile, exclusive
of a border of coral rock, which runs down along each side,
extending about a 100 yards from the shore. The anchorage
is surrounded, from 1 to 5 fathoms water, by the kind of
islands to be felt and clayey, that great difficulty occurs in weighing
the anchors. Toward the bottom of the harbour, there is
shallow water for about half a mile, beyond which the two
islands approach so near each other, as to leave only a pas-
Sage at high water for boats. The most convenient place
for watering is at a beach on the eastern side, where is a
small stream that furnishes 14 or 15 tons of water a day.
Sir George Stanton says, that beyond the beach, which
fletcher across two-thirds of the entrance, at the southern
extremity of the spacious bay on the eastern side of the
island, there is a safe passage to the inner part of the bay,
the north of which is sheltered by a small island lying to the
southeast. The whole of the bay, he says, is formed by
four small islands, which approach so nearly to each other
as to appear, from several points, to join. They all seem to
be the rude fragments of primitive mountains, separated
from the great continent in the lapse of time. This island
has convenient anchoring places in either monsoon; and Sir
Geo. Dedier, a French engineer, who surveyed the island
about the year 1720, says, that none of the fruits or exotical
plants, so common in the other parts of India, are to be
found here, except water melons, a few potatoes, small
gourds, chaballeys (a small species of onion), and little black
beans. At present, besides the buffaloes, of which there
are large herds, it supplies remarkably fine fat hogs, of the
Chinese breed. There are also some of the wild fowl in the
woods, which also abound with monkeys and squirrels. One
species of the squirrel is of a beautiful shining black colour,
and another species is striped brown and white, which is
called the flying squirrel, from its being provided with a
thin membrane, resembling the wing of a bat, extending on
each side of the belly, from the neck to the thighs, which,
in stretching out the legs, spreads, and enables it to fly
from tree to tree, to a considerable distance. Lizards are
found in great abundance; but Capt. Gore says, that none
of his company discovered the guano, and another animal
described by Dampier as resembling the guano, only much
larger. Among the vegetable improvements of the island
are fields of rice and tobacco, and groves of cabbage paln-
trees, plantains, various kinds of pompons, cocoa-nuts, or-
ges, shadoocks, and pomegranates. These improve-
ments are ascribed to the French, for the purpose of making
it
it a more convenient refreshing fixture for any of their ships that may be bound for Cambodia, or Cochinchina; and for this purpose it is well situated. The woods are well stocked with feathered game; and particularly with wild hens and cocks, resembling those of our own country. The land in the neighborhood of the harbour is a continued high hill, richly adorned with a variety of fine tall trees, from the summit to the water’s edge; and among others the tea-tree, defrayed by Dampier.

The town in this island is situated near the sea side, at the bottom of a steep hill, which affords a fine view during the prevalence of the S.W. monsoon. It consists of between 20 and 32 houses, built close together; besides six or seven others that are scattered about the beach. The roof, the two ends, and the side fronting the country are nearly constructed of reeds; the opposite side, facing the sea, is entirely open; but by means of a fold of bamboo screens, they can exclude or let in as much of the sun and air as they please. There are other large screens or partitions, for the purpose of dividing, as occasion requires, the single room, of which the house properly speaking, consists, into separate apartments. The largest house of the town, belonging to the chief, or captain, had a room at each end, separated by a partition of reeds from the middle space, which was open on both sides, and provided with partition-fercons like the others. It had, besides, a pent-houfe, projecting four or five feet beyond the roof, and running the whole length on each side. At each end of the middle room were hung some Chinese paintings, representing men and women in ludicrous attitudes. In this apartment Capt Gore’s companions were usually defrayed to feast themselves on mats, and they were provided with bottles. In one of the apartments, visited by Sir George Staunton, was an altar decorated with images; and the partitions were hung with figures of monstrous deities; but the countenances and deportment of the people exhibited no idea of religious awe, nor was any person observed in the posture of prayer or adoration. A few spears stood against the wall with their points downwards, together with some matchlocks, and a swivel-gun.

The inhabitants of this island, who are fugitives from Cambodie and Cochinchina, are not numerous. They are of a short stature, very swarthy, and of a feeble, unhealthy aspect, but seemingly of a gentle disposition. The dress of these people is composed chiefly of blue cotton, worn loosely about them; and their flat faces and little eyes indicate a Chinese origin or relation. Their colloquial language is altogether different from that which is spoken in China, but their written characters are all Chinese.

The English settled in this island in 1702. When the factory of Chusan, on the coast of China, was broken up, and the English with them some Macassar soldiers, who were hired to assist in building a fort; but the president not fulfilling his engagement with them, they watched an opportunity, and in one night murdered all the English in the fort. Thereafter the fort, hearing a noise, took the alarm, and ran to their boats, very narrowly escaping with their lives; but not without much fatigue, hunger, and thirst, to the Jaffna dominions, where they were treated with great humanity. Some of them afterward went to form a settlement at Banjer-Maffin, in the island of Bornoe. Since this event, no Europeans have ever refixed in this island. The latitude of this island, calculated from a meridional observation, as stated by sir Geo. Staunton, is 8° 40’ N. and its longitude, according to a good chronometer, 107° 55’ E. The harbour in which Capt. Gore was stationed, is in N. lat. 8° 45’ E. long., deduced from a great number of lunar observations, 106° 18’ 46’; dip of the N. pole of the magnetic needle, 2° 18’; variation of the compass, 6° 14’ W.; high water at the full and change of the moon, 4° 16’ apparent time. The water rose and fell 7 feet 4 inches perpendicular. Voyage to the Pacific Ocean, by captains Cook, Clerke, and Gore, vol. iii. p. 450. &c.

Conders, in Ornithology, the Vultur Gryphus of Latham, (Ind. Orn.) Klein, Griffen, Borowski, the conur of Lact and Ray, the conur of Fresner, Condamine, Buffon, and Molini, and the conur of Latham (Syn. and Ship.) is a bird of enormous size, having a longitudinal very wide and circumferential. It inhabits South America; and its size is so enormous that the wings, when extended, measure 9 feet, or even 16 feet from top to tip; the largest quill-feathers of the wings sometimes measure 2 feet in length, and the quill-part 1/5 inch in circumference. The body is of a black colour, with a white back; the neck is surrounded with a collar of longth white feathers; the chin is reddish; the head is clothed with brown down or wool; the eyes are black, with cheetah or light reddish irides; the bill is black, with a whith point; the legs and feet are black, and the claws are flinty; the tail is small. The female is considerably larger than the male, which it resembles, except in having a crown crest or tuft on the forag, or hinder part of the neck. The condore builds its nest on the highest mountains, under the shelter of some projecting shelf of a rock, in which the female lays two white eggs. It preys on calves, sheep, goats, and such animals, and when very much pressed by hunger, it has been known to carry off children of ten years of age; and two of them are said to be able to devour the carcass of a cow at one meal. When it alights upon the ground, or rides from it, the noise it makes with its wings is such as to terrify, and almost to deafen, any one who happens to be near the place. Don Ulloa informs us, that he actually saw one of them rising with a lamb in its talons. The Indians have various ways of catching them: besides traps and snares laid for them near any carrion, they kill a cow or other animal, and moisten its flesh with the juice of some strong intoxicating herbs, and then bury the body till it putrefies. In this state they take it up and lay it on the ground; and when the condores come near to devour it, they are intoxicated and rendered motionless; when the Indians fall upon and kill them.

Condornentes, religious sectaries, whereof there have been two kinds. The first arose in Germany, in the thirteenth century; their leader was a native of Toledo. They held their meetings near Cologne; where they are said to have worshipped an image of Lucifer, and to have received answers and oracles from him: the legend adds, that an ecleclic having brought the emerald to it, the idol broke into a thousand pieces; which put an end to the worship. They had their name from their lying all together, men and women, young and old.

The other species of Condornentes were a branch of Anabaptists in the sixteenth century; so called, because they lay, several of both sexes, in the same chamber; on pretense of evangelical charity.

Condottiére, in the Italian Policy, denoted leaders of bands, who, in the 15th and 16th centuries, made a trade of war, and raised soldiers in order to hire them out to different states.

Condren, Charles de, in Biography, superior general of the fathers of the oratory, was born near Soiffons in the year 1538. By his father, who was in high estimation in the court of Henry IV., he was designed either for a
peft about the king, or for the military profession. His own inclinations, however, led him to think of the church, as most suited to his talents, to which, after some hesitation, his father gave an affent. He accordingly prosecuted his studies in the college of the Sorbonne at Paris, was ordained priest, and admitted a doctor of that society in the year 1614. In the following year he became a member of the congregation of the oratory, and founded some houses belonging to that order. He was not long in obtaining a distinguished reputation for integrity and prudence as a man, and for piety and benevolence as a priest. One of the chief traits in his character he was fixed upon as the most proper person to be confessor to the duke of Orleans, only brother to Louis XIII. In this situation he was successfully employed in confidential business between the duke and the king, and was the happy means of restoring those princes to a mutual good understanding with one another, after long and violent disaffections. For these services he was offered the archbishopric of Lyons, and a cardinal's hat; but he declined accepting of honour and emolument for having performed those acts, which, his religion taught him, were binding upon every Christian. He died in the year 1641, leaving behind him many pieces which evidenced superior talents, and a sincere piety. His principal works are, "Discourses and Letters," 2 vols. 12mo. 1648; and "An Explanation of the Priesthood of Jesus Christ," published in 1677. Father Amelot wrote up an account of his life, in which there is a collection of his letters and maxims with an exposition of his opinions. Nouv. Dict. Hist.

CONDRIEUR, in Geography, a small town of France, in the department of the Rhône, at the foot of a hill on the river Rhône, 21 miles from Lyons. This place is celebrated for its excellent sweet wine.

CONDROS, CONDROZ. in Geography, is a tract of land in the circle of Weilphalia, situated in the bishoppate of Liége, which formed part of the German empire, and is now incorporated with France. Condrus, in ancient geography, was reckoned part of Belgium. Huy, which was considered as the principal town of Condros, is, at present, the chief place of the district of the same name in the department de l'Othe. See Huy.

CONDUCT, f. See Safe-conduct.

CONDUCTOR (from conduct, and to conduct from the French conduire) prn., in Electricity, is a body of a conducting substance (vix. such as will transmit the electric power or fluid) placed immediately before the glasses cylinder, or globe, or plate, or other excitable body, of an electrical machine. Its object is to collect the electricity, and to convey it either in the form of sparks, or electrically, to other bodies that may be presented to it in the course of experiments. Without this prime conductor no large sparks could be drawn immediately from the excited electric, because the electric body, being in its nature incapable of conveying the electric fluid through its subsidence, discharges, on a body which is presented to it, that quantity of electricity only which is accumulated upon its own part of its surface. But when the prime conductor is placed before the excited electric, the former successively collects all the electricity from the surface of the latter, whilst revolving; and if a proper body be brought near its surface, the electricity which has been accumulated, will rush from every part of the surface of the prime conductor in a copious stream, or in a full spark, to that body.

The forms of prime conductors have been continually varied from the very first invention of electrical machines, according as new discoveries, or the progress of experience, have either detected former defects, or suggested more advantageous forms. A gun-barrel, or a metallic chain, supported by silk rings, formed the prime conductor of the earliest electrical machines, viz. such as were used towards the beginning of the fall, or eighteenth century. And in consequence of this usage some distinguished late writers on the continent, have retained the name of chain for the prime conductor, long after the shape of that instrument had undergone a total alteration. See "l'Elettrifico artificiale del P'Becaria."

Though the gun-barrel or the chain would be highly improper for the modern electrical machines, either of them was quite sufficient for those of the old construction, in which the excitation was very slight and difficulty obtained. But when the glass globes of cylinders began to be made much larger, when a better method of excitation was discovered, and especially when Mr. Canton's amalgam was introduced, to which the great power of the modern electrical machines is principally owing; then the chain or the gun-barrel was found incapable of retaining the electric power, so that every narrow edge, or point, or curvature of the frame, was found to dissipate the electricity into the surrounding air, as could be easily perceived in a darkened room. This suggested the idea of enlarging the size, and smoothing the irregularities of the prime conductor, in consequence of which some prime conductors were made of brass, others of tin, or even of gilt paper; and their shape became much more regular and compact. A cylinder with spherical terminations has been the most usual form of prime conductors. A few were made spherical; Dr. Priestley used one of a pear-like figure, and some have also been made of other fanciful shapes. But amongst all those forms, which the practice of the best electricians has found to be, upon the whole, the most eligible, is the abovementioned one of a cylinder with hemispherical terminations. These terminations, in small prime conductors, sometimes are made a little larger in diameter than the cylinder; but in the prime conductors of the larger kind, they do not project beyond the surface of the cylindrical part. As the conducting nature of their substance must be of the kind last, the prime conductors are made of metal, at least on their surface. The small ones are made of hollow brass, or tin plates, or of wood covered with tin-foil. But the large ones are almost always made of wood, or paste-board covered with tin-foil. The prime conductors of tin are frequently covered with a black varnish, which is preferred cleaner than the surface of the tin, and may perhaps in some measure prevent the dissipation of electricity from their surface. In any construction, care must be had, that the surface of the prime conductors be quite free from points, and sharp edges; and if holes are to be made in them, which indeed are necessary for the performance of various experiments; these should be well rounded off and their edges burnished. The prime conductor is generally supported in an horizontal position, by one or two glass dishes, which proceed from the bottom board of the electrical machine, or from separate wooden stands; the extremities of those glass dishes entering a little way within the surface of the conductor. The direction of the prime conductor is mostly perpendicular to the axis of the glass cylinder of the machine; but in some electrical machines, the conductor, or two conductors, are situated parallel to the abovementioned axis. When two conductors are allied to the machine, one of them, which collects the electric fluid from the excited glass, is called the positive conductor, and the other, which is connected with the rubber, is called the negative conductor. At that extremity of the prime conductor, which stands nearest to the glass globe or cylinder, when the former is perpendicular to the
CONDUCTORS.

axis of the latter, or on the side when it stands parallel, the collector is affixed. See Collector.

To the opposite extremity of the prime conductor which stands farther from the glass cylinder or globe, a thick brass wire, with a pretty large and smooth brass ball, is usually affixed, and from this ball the longest and densest spark may be drawn; the greatest endeavour of the electric fluid to escape from the prime conductor being made at that extremity. In plate machines, viz. where glass plates are used instead of a globe or cylinder, the extremity of the prime conductor is furnished with two semicircular projections, which carry the collecting points at their extremities. The size of the prime conductor must be proportionate to the size of the machine; for if the prime conductor be too small, the sparks that are drawn from it will not be of the largest size possible to be obtained with that machine; and, on the other hand, if the prime conductor be too large, the diffuseness of electricity from its surface will be very considerable. It is difficult to determine the exact size which might be the most advantageous for a given machine; for with cylinders of the same size, different prime conductors might be used, according as the glass cylinders are more or less capable of a vigorous excitation. With one of the largest glass cylinders ever made in this country, which measured two feet in diameter, a sponge conductor of wood covered with tin-foil was used, which measured six feet in length and 18 inches in diameter. With a small machine, the cylinder of which was seven inches in diameter, a prime conductor of two feet by three inches and a half was found the most advantageous. When the electrical machine is to be used only for charging a battery, then it will be better to use a very small prime conductor.

The forms of the above-mentioned prime conductors are represented in the various plates relating to electricity that are contained in this work.

Conductor of Lightning. See Conductors.

Conductor, in Surgery, is an instrument which serves as a guide for a scalpel, in several operations which do not allow the surgeon's determining the exact course or extent of a wound. For instance, in opening a fibrilous orifice, or dilating the abdominal ring in a strangulated hernia.

Conductors are either made of steel or of silver; and always have a groove on one side, to direct the cutting instrument. That which the surgeon employs in cutting for the stone is named a GORGET. This is an instrument generally made of steel, and introduced, in the operation of Lithotomy, through the artificial orifice, into the bladder, in order to widen the neck of the bladder, and facilitate the introduction of the forceps, with which the stone is to be extracted. There are two species of this instrument; the one, which is provided with a knob at the top, is termed the male gorget; and the other with an excavation, the female gorget. See Lithotomy.

There is also a machine invented by Mr. Walker, by means of which, a patient labouring under a simple or compound fracture of the leg, may be conducted with safety and convenience from one place to the other, and the extremities of the bones kept in their proper situation during the progress of the cure.

To this head belong the conducting apparatus invented for the same purpose by Mr. Theiden of Prussia, which are used in fractures of the superior and inferior extremities. Machines adapted for fractures of the femur have been described by Mr. Schmiuck, and those for other parts by Mr. Theiden himself. Mr. Richter conceives that these machines may be rendered more serviceable, by constructing them of iron, instead of walnut-tree wood.

Conductors. In two important branches of natural philosophy, a marked distinction has been observed between the various known bodies of the earth; and upon the peculiar properties of the two different classes of bodies, which are discriminated from each other by the above-mentioned distinction, numerous phenomena, of consequence to the human species, are absolutely depending. The two branches, of natural philosophy, above alluded to, are the science of electricity and the subject of heat. In electricity, if an excited piece of glass, or an electrified conductor, be touched with the extremity of a flick of sealing-wax, which a man holds by its other extremity; or if it be touched with the extremity of a silk string, the electric power will not be dissipated; but if the electrified body be touched with the extremity of a rod of iron or brass, held in a manner similar to the flick of sealing-wax, the electric power will be instantly dissipated; viz. it will pass through the metallic rod, and through the person that holds it, &c.

Hence it evidently appears, that iron or brass will permit the transition of the electric power through its subsistence; whereas sealing-wax or silk will not permit it. Therefore, iron, brass, and all those substances through which the electric power can be transmitted, are called conductors of electricity; and all those substances which, like the sealing-wax or silk, will not permit the passage of the electric power, are called non-conductors of electricity.

A similar distinction has been remarked in the subject of heat and cold. Take a small piece of charcoal, make it red hot at one end, and in that state it will be found that a person may hold it with his fingers within about a quarter of an inch of the red hot extremity, without feeling any unpleasant degree of heat; but if an iron rod as thick as the charcoal be rendered red hot at one end, a person will not be able to hold it within less than four or five inches, at least, of that end; and such is the case with all metallic bodies, as well as with some other substances; which shews that heat will pass through certain bodies much more easily than through others. Hence those bodies which, like the non-rod, will easily transmit the heat through their subsistence, are called conductors of heat; and those which will convey it with great difficulty, are called non-conductors of heat. It must be observed, however, that though heat will pass incomparably more easily through certain bodies than through others; and all those substances that are known to be either perfect conductors or perfect non-conductors of heat.

And indeed, the like observation, though in a much more limited manner, may be made with respect to the conductors of electricity.

In magnetism also, the name of conductor of that power has been given to a single substance, namely, to felt iron; but the peculiar nature of iron in that respect, or rather the passage of the magnetic power, will be explained under the article Magnetism. We shall now in an orderly manner state the various particulars which have been ascertained with respect to the above-mentioned two classes of bodies; viz. first, with respect to electricity, and then with respect to heat.

Conductors of Electricity. In endeavouring to point out the true nature of electrical conductors, it becomes necessary to give a hint likewise of the non-conductors of that power, since these two classes of bodies gradually approach each other, in proportion as they are less perfect of their kind, as far as certain substances, which seem to stand in an intermediate state between conductors and non-conductors, so as to participate of both. Glafs, sealing-wax, amber, fik
CONDUCTORS.

Silk, and several other bodies, which, by means of friction with a dry and clean hand, are capable of being excited, so as to exhibit electrical phenomena, are called electrics; and these identical bodies have been found to be non-conductors of electricity; hence electrics and non-conductors mean the very same class of bodies. In the same manner it has been found, that those bodies, which will easily transmit the electric fluid through their substance, cannot be excited in the above-mentioned manner; hence conductors and non-electrics do also denote the same bodies.

Strictly speaking, as we have already hinted above, there is no substance which may be called a perfect conductor or a perfect non-conductor of electricity; the electric power finding some resistance in its passage through the belt conductors, and being in some degree capable of passing through the belt electrics, at least under certain circumstances. The following lists contain the conductors and the electrics, or, which is the same thing, the non-electrics and the non-conductors. They are disposed in the order of their perfection; that is, the belt conductors and the belt electrics are placed at the heads of their respective lists; and those which participate of both, meaning those which are partly electrics and partly conductors, will be found towards the end of each list. In this, however, no great accuracy must be expected; first, because a very accurate discrimination is impracticable when substances are expressed under general denominations; and, secondly, because the precise degree of conducting or non-conducting power in most substances cannot be determined on account of their fluctuating nature.

Conductors.

<table>
<thead>
<tr>
<th>Gold</th>
<th>Silver</th>
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<tbody>
<tr>
<td>Copper</td>
<td>Platinum</td>
</tr>
<tr>
<td>Brass</td>
<td>Iron</td>
</tr>
<tr>
<td>Tin</td>
<td>Mercury</td>
</tr>
<tr>
<td>Lead</td>
<td>Semi-metals</td>
</tr>
<tr>
<td>Metallic ore</td>
<td></td>
</tr>
</tbody>
</table>

Metallic ores; of which the best are those which contain a greater proportion of metallic parts, and nearest to a guinean state.

Charcoal, either of animal or vegetable substances. The conducting power of charcoal is very equivocal; for some pieces of it will hardly conduct at all, and others will suffer the passage of the electric fluid over their surface only, and not through their substance. The reason of this difference is not quite understood; but it seems owing to the degree of heat that is applied in the process of making them. See Priestley's second volume of Observations on different Kinds of Air, sect. xiv.

Electrics.

Gla's, and all vitriifications, even those of metals.

All gems, of which the most transparent are generally the best.

All resins and resinous compounds.

Amber.

Sulphur.

Baked wood, if not suffered to imbibe moisture.

All bituminous substances.

Wax.

Sik.

Cotton.

All dry and external animal substances, as feathers, wool, hair, &c.

Paper.

White sugar and sugar-candy.

Air, and other gases.

Oils.

Dry and complete metallic oxides.

The ashes of animal and vegetable substances.

All dry vegetable substances.

All hard stones, of which the hardest are the best.

Soft stones when heated, according to Delaval.

Powders not metallic, according to Delaval.

Ice, at the temperature of $-13^\circ$ of Fahrenheit's thermometer, according to Achard.

According to Mr. Walsh's, and Mr. Morgan's experiments, the Torricellian vacuum ought to be placed at the head of the list; but the singular nature of a vacuum, though a non-conductor, will hardly entitle it to the name of an electric. We must, however, refer all farther observations, respecting electrics, to the article of that denomination; the
the above lift having been inserted in this place merely to elucidate the nature of conductors.

Thus far we have stated the number of conductors, and their gradation, with respect to common electricity; but that lately discovered branch of this science, which is at present avidly cultivated under the title of Galvanism, has pointed out a peculiar arrangement of conductors with respect to the order of their capability of conducting that power which affects the limbs of a prepared animal, and of conveying the power of a galvanic, or rather a voltaic, battery. See the article Galvanism. Concerning the former of these powers, we transcribe a lift, followed by a few remarks, from Cavalli's Treatise on Electricity, 4th ed. vol. iii. p. 29; and with respect to the latter, we subjoin an abridged extract from a paper of Erman, in the Annales de Chimie, Feb. 1807.

Conductors of Animal Electricity, according to Dr. Lind's and Mr. Cavalli's experiments, which however are arranged with indifference by the latter, considering the difficulty of making the arrangement, and that, in this branch of electricity, the metals do not seem to act merely as conductors—The lift begins with the bat.

1. Maleable platina.
2. Silver.
4. Quicksilver.
5. Copper.
7. Tin.
8. Lead.
10. The human body.
11. Salt water.
12. Fresh water.

The metallic ores are not so good conductors as the purified metals themselves, and their conducting power is various according to the nature of the ores, but even the metallic faults are tolerably good conductors.

It is very remarkable, that the flame of tallow candle, which is a good conductor of common electricity, will not conduct the animal electricity, when placed in a short interruption made in the circuit of communication. Charcoal, placed in the flame situation as the flame of the candle, was also found to be a non-conductor, except when it was actually burning, in which state it conducted tolerably well; but Mr. Volta says that he has found some pieces of charcoal that acted as well as the metals. Dr. Valli observed, that human bodies are not all equally good conductors. Out of four persons in a company, he found that when two of them formed the circuit of communication between the nerve and the muscles of a frog, the motions took place very readily. When a third person formed the circuit, the motions were very weak; but that when the fourth person formed the communication no motion took place. This experiment, he adds, was often repeated with the same success. The effect, however, may be owing to the different dryness of the skin. Vitriolic acid, and what is very remarkable, alcohol, appear to conduct this property rather better than water.

The arteries and the veins are not so good conductors as the nerves; for when a blood-vessel forms part of the circuit of communication, the contractions will take place only when nervous ramifications are adhering to it, and if these be carefully separated, the motion will not take place. The same thing may be said of the tendons, the bones, and the membranes; for when either of these parts is separated from the body, and is introduced in the circle of communication between the muscles and nerves of a prepared frog, no motion will ensue, excepting, indeed, when those parts are full of moisture, and are in immediate contact with the nerve of a prepared frog. Dry nerves are not conductors of animal electricity. Dr. Valli found that the internal fibres of a nerve conducts much better than its external, or coat.

Silver and zinc, profcssor Aldini says, will produce contractions in the muscles of a frog, many hours after it has become insensible to the action of either of them, separately used.

Mr. Erman, in his paper on two new classes of galvanic conductors, says that the bodies which may be applied to the poles of a galvanic pile are, I. Non-conductors. II. Conductors. The conductors are either perfect or imperfect; and the imperfect conductors are fo, either with respect to both poles, or with respect to one of the poles of a galvanic battery.

I. The perfect non-conductors prevent the communication of the power of both poles effectually; and such are galls, refins, ice, and the vapour of water, sulphur and its flame, amber, but not its flame.

II. The perfect conductors, which discharge both poles completely, are the metals, and all in the same degree.

The imperfect conductors of both poles. These, though capable of forming the galvanic circuit, exhibit in their extent effects of two different kinds. Fluid water and bodies impregnated with water are of this nature.

The imperfect conductors of the positive pole only. These are incapable of forming the galvanic circuit; for when interposed between the two poles of the pile, they infupe the negative power and conduct the positive; whence it follows, that the negative becomes charged, whereas the positive is conducted. The flame of hydrogen gas, and the flame of the hydrocarbonated bodies, have this property.

Lastly, the imperfect conductors of the negative pole only impufl the power of the positive, and conduct the power of the negative pole. Of this sort are the flame of phosphorus and of alkaline foams.

There now remain two other particulars, which demand our examination with respect to the conductors of electricity. These are the method of ascertaining their peculiar degrees of conducting power, and their nrcs. The simplest method of determining whether any given body be a conductor or not, is to affix an electrometer to the prime conductor of an electrical machine, and when the machine is in action, and of course the electrometer is diverging, to touch the prime conductor with one extremity of the given body, which the operator holds in his hand by the other extremity; for if, in so doing, the electrometer collapses, the body in question is a conductor; but if the electrometer continues to diverge, that body is a non-conductor. Its degree of conducting power may also be, in great measure, estimated from the quickness with which the electrometer loses its divergency. In the performance of this experiment, the operator should take care that the electric fluid does not run over the surface of the body under trial to the hand that holds it, which generally takes place when the machine acts powerfully, and the body in question is not much extended. In this case, it becomes proper to stop the revolution of the glass globe or cylinder, when the body is to be put in contact with the prime conductor. But if the body be very small, it will be sufficient to use a simple electrometer only, which may be easily caused to diverge by means of an excited flock of sealing-wax, and may then be touched with the body in question. Yet all this is not sufficient.
sufficient to discriminate the peculiar powers of substances that are of the same class, such as the various metallic substances, the different classes, &c. And for this purpose various other means may be adopted, according to the nature of the bodies under examination. The best way of determining the peculiar conducting powers of metallic substances, is to have wires of the different metals drawn through the same hole, so as to be precisely of the same diameter, and then melt them by the discharge of a battery; viz. take a wire, of about one-fiftieth of an inch in diameter, and connect it with the outside of a battery, containing at least thirty square feet of coated surface, and connect the other extremity of the wire with one branch of the discharging rod. Then, when the battery is charged, touch the wires which proceed from the inside of it with the other branch of the discharging rod, which will force the expulsion to pass through the wire that has been interposed between the battery and the discharging rod, generally melting a greater or a smaller part of it, according to the nature of the metal. Thus by repeating the experiment successively with wires of the same length and diameter, but of different metallic substances; charging the battery constantly to the same height, which may be easily accomplished by means of a quadrant electrometer; and measuring the length of each wire that has been melted by the explosion; their various conducting powers may be ascertained; observing that the worst conductors are more easily melted, and vice versa.

Mr. Henley found that the same charge melted 4 inches of gold wire, 6 of brass, 8 of tinned copper, 10 of silver, and rather more than 10 of iron. In melting wires of a considerable length, as for instance two or three feet, it often happens that the force of the explosion barely renders it red hot, without actually melting it. In this case, it is curious to observe that the redness appears first on that extremity of the wire which communicates with the positive side of the battery, and thence proceeds towards the other end of the wire, which furnishes ocular proof of the theory of a single electric fluid; the wire, however, is not rendered red hot at one extremity before the other, in consequence of the progressive motion of the electric fluid through it, but because that fluid loses some of its impetus in going through the wire, so that the wire suffers the greatest effect of the shock on that end which the electric fluid enters; in consequence of which, that end will be rendered red hot much sooner, and in a greater degree, than those parts which are more remote from it.

When the conducting powers of different fluids are to be ascertained, the best method of performing the experiment is to fill very narrow glass tubes, such as are used for spirit thermometers, with the fluids in question, introducing a point at each end of the tubes; and to present them successively to the prime conductor, after the manner already described. For other kinds of bodies other methods may be adopted for ascertaining their conducting powers. Thefe, however, need not be particularly described; first, because they may be easily derived from the fole that have been described above; and, secondly, because they must be varied according to the nature of the bodies in question. After all, it must be acknowledged, that the metals excepted, no very great degree of accuracy can be expected with other substances; since the fluctuation of their conducting powers arises from a variety of places, and almost imperceptible differences, such as the difference of temperature, of moisture, of admixture with other substances, &c. Thus, glass itself becomes a conductor, when heated to a certain degree; and the very same body will conduct more or less readily, even by being placed nearer to or farther from certain other bodies.

In considering the conducting power of natural bodies, one may naturally ask, whence does that property arise; or how is it, that certain bodies will, whilst others will not, conduct the electric power? The present state of knowledge, however, does not afford a satisfactory answer to this question. Various suppositions have been offered by the late Dr. Priestley and others; but as they are insufficient for the explanation of the phenomena, we shall not attempt to state them in this place.

The uses of conductors are remarkable and extensive, though they are not yet fully ascertained to the entire satisfaction of the speculative philosopher. In the first place, the science of electricity, or the existence of the electric power, would be absolutely unknown, were it not for the difference of conducting and non-conducting bodies; for otherwise the electric fluid which is manifested to us, and operates merely by its passage from one body to another, could neither be confined nor accumulated in any place; in consequence of which, its uniform dispersion throughout the universc would remain invisible, and unsuspected.

But the movements of conducting and non-conducting bodies in the world, their contact, or even their approach without any actual contact, condenses the electric fluid in one place, and rarefies it in another; and this takes place between the clouds and the earth, &c. By the change of their states of existence, some bodies absorb from other bodies, and others deposit upon other bodies considerable quantities of electric fluid. Thus, a perpetual and ample circulation of this fluid is continually kept up amongst all the substances of the terrene globe, whence thunder and lightning, vaporization, and probably several other important operations of nature, are derived. In order to understand the action of conductors when opposed to each other, see the nature of electric atmospheres under the article Electricity.

The greatest advantage which mankind have derived from the knowledge of the present subject, is the adoption of a conductor for the preservation of buildings and vessels against the dire effects of lightning. The identity of electricity and lightning proved by Dr. Franklin, and his subsequent introduction of conductors for preserving buildings, form two of the grandest discoveries of the last century. It was proposed by the above-mentioned philosopher to raise a metallic conductor some feet above the highest part of the building, to continue the same down along the outside of the wall, and below it, deep into the earth, or, which is preferable, to connect it with some well or drain. By these means the house would have little to apprehend from a stroke of lightning; for, since an electrified body is well known to strike the nearest and belt conductors that may happen to be in its way, it is evident that the conductor fixed in the abovementioned manner, being of metal, and higher than any part of the building, would naturally be struck by the lightning in preference to any other part, and would conduct it to the ground, without any damage to the building.

This reasonable proposal was no sooner offered by the sagacious Franklin, than it was adopted in America, in Europe, and elsewhere. Numerous facts soon proved the usefulness of such conductors, and extended its adoption; by flying that several houses, which before had been repeatedly struck by the lightning, escaped unhurt after the application of the conductor; that, in many places, the conductors of houses were actually struck by the lightning, which melted them about their extremities, yet the houses themselves received no injury; and so forth.

Though the conductors were instantly adopted, yet their
most useful form, especially with respect to their upper termination, has been much controverted; and it is but lately that the true state of the question has been elucidated. The question was, whether the conductors should terminate in a point, according to Dr. Franklin's original proposal, or in a ball. Mr. B. Wilson exhibited some experiments, in which a point was struck at a greater distance than a ball; whence he concluded, that as the point would attract the lightning from a greater distance, a blunt termination ought to be preferred, since, in certain cases, it would avoid a stroke of lightning, which the pointed termination would not. (Phil. Trans. for 1778.) Mr. Nairne, on the other hand, showed some experiments, in which a ball was struck in preference to a point. And this indeed is confirmed by a great variety of other experiments. In short, a pointed conductor will draw the electric fluid from an incomparably greater distance than a blunt one; but it will draw that fluid gradually, in a dream, or fluent manner; whereas the blunt termination will receive it in a full spark, or at once; hence a pointed conductor will tend to diminish the quantity of electricity in a cloud, previous to its coming too near, and thus it may protect a greater extent of building than a conductor with a blunt termination, since the object of fixing a conductor to a house is to protect the house from the effects of lightning, and not the conductor from transmitting the matter of the lightning.

Upon the whole, considering the immense quantity of electricity in a thunder cloud, and the little difference between the action of a blunt or a sharp conductor with respect to that quantity, the difference of those terminations seems to be of little consequence than it was apprehended in the fervour of the dispute. After all the experiments and the discussions made for the purpose, "A conductor," Mr. Cavallo observes, "to guard a building, as it is now commonly used in consequence of several considerations and experiments, should consist of one iron rod, (copper would do much better, it being a more perfect conductor of electricity, and at the same time not being so subject to contraction as iron,) about threequarters of an inch thick, fastened to the wall of the building, not by iron cramps, but by wooden ones. If the conductor were quite detached from the building, and supported by wooden poles at the distance of one or two feet from the wall, it would be much better for common edifices; but it is more particularly advisable for powder magazines, powder-mills, and all such buildings as contain combustibles ready to take fire. The upper end of the conductor should be terminated in a pyramidal form, with the edges, as well as the point very sharp; and if the conductor be of iron, it should be gilt or painted for the length of one or two feet. This sharp end should be elevated above the highest part of the building, (as above a flake of chimney, to which it may be fastened,) at least five or six feet. The lower end of the conductor should be driven five or six feet into the ground, and in a direction leading from the foundations; or it would be better to connect it with the nearest piece of water, if any be at hand. If this conductor, on account of the difficulty of adapting it to the form of the building, cannot conveniently be made of one rod, then care should be taken, that where the pieces meet they be made to come in as perfect a contact with one another as possible; for the electricity finds considerable obstruction where the conductor is interrupted. For an edifice of a moderate size, one conductor, in the manner already described, is perhaps sufficient; but, in order to secure a large building from fulfilling any damage by lightning, there should be two, three, or more conductors, in proportion to the extent of the building."

"In ships a chain has often been used for this purpose, which, on account of its pliability, has been found very convenient, and easy to be managed among the rigging of the vessel; but as the electricity finds a great obstruction in going through the several links, for which reason chains have been actually broken by the lightning, so their use has now been almost entirely laid aside; and in their stead, copper wires, a little thicker than a goose-quill, have been substituted, and have been found to answer very well. One of these wires should be elevated two or three feet above the highest mast in the vessel; this should be continued down the mast, as far as the deck, where, by bending, it should be adapted to the surface of those parts, over which it may roll conveniently be placed, and, by continuing it down the side of the vessel, it should be always made to communicate with the water of the sea."
Rarefaction or condensation alters the conducting powers of several bodies. Yet the rarefaction of air is by no means accompanied with a proportionate diminution of its conducting power.

Professor Pictet supposes that heat ascends within solid bodies more readily than it descends; *viz.* that in communicating heat to a solid body by the lateral application of a hotter body, the upper parts of the former are heated sooner than the lower. This effect, however, may with propriety be attributed to the ascending current of heated air which rises along the surface of the body, and causes colder air to approach the lower part of the body; hence the heat is continually carried upwards.

The conducting power of a body changes likewise, in consequence of an alteration of the surface; so that polished and figured are likewise concerned in the reception as well as in the propagation of heat. These particulars, however, together with the reflection and refraction of heat, from the surface or through the substance of bodies, will, with more propriety, be explained under the article Heat.

Fluids are, upon the whole, very imperfect conductors of heat, and Count Rumford was led, by his experiments, to conclude that heat is not at all propagated through them by contact, as it is in solids. (See Rumford's paper on the Conducting Property of Fluid, *&c.* Phil. Trans. 1805.) Whatever permits or promotes the motion of the particles of a fluid, contributes to the propagation of heat—*viz.* obstacles that motion, retards the propagation of heat through them. The particles of air which come in contact with an heated body, being thereby heated and rarified, become specifically lighter than the surrounding air, and of course ascends; other air then comes in contact with the heated body, and this also being heated is caused to ascend, and so forth. Thus is heat conveyed from the original hot body, by the air, to a distance from it; but if that motion of the air be obstructed, as by the intervention of partitions of paper, wool, cotton, furs, and the like, then the communication of heat is prevented more or less effectually. It is principally on this account, that furs, feathers, sable, down, cotton, and other similar things, form warm coverings; *viz.* because, by preventing in great measure the motion of the air between their filaments, they prevent at the same time the dissipation of heat.

The like observations are applicable to water, and perhaps to all other fluids. When a vessel full of water is set upon the fire, the particles of water that are close to the bottom of the vessel are first heated and rarified; in consequence of which they ascend, and other colder particles take their place, which, being heated, likewise ascend, and so on. If the fire be applied to the upper part of the water, the fluid will not be heated, or at most it willsurname the surface. Count Rumford (see his 7th Essay) confined a piece of ice at the bottom of a pretty tall glass vessel full of water nearly boiling, and noted the time it took up to melt the ice. The experiment then was repeated with this difference, *viz.* that a similar piece of ice was placed on the surface of the hot water, instead of the bottom. It was found that the ice melted more than eight times quicker in this last situation than in the former. The result of this remarkable experiment is explained in the following manner. When the ice swims on the surface of the hot water, the particles of the latter, that are contiguous to the ice, being cooled by it, descend, and other hot particles of water take their place, which deposit their heat upon the ice, and, being thereby rendered specifically heavier than the next particles of water, also descend, and so forth. But when the ice is confined, the
The bottom of the vessel, the particles of hot water which come first in contact with it, are cooked, and are rendered specifically heavier, in consequence of which they remain in their place, and no motion will take place within the water; hence the ice is not melted nearly so readily as in the former situation. Now count Rumford contends that it is by means of the above-mentioned motion only that heat is propagated through fluids, and not otherwise. This conclusion was no sooner published to the scientific world, than it was opposed in an able paper by very skilful philosophers. See Dalton's paper. Nich. Journ. vol. iv. p. 75. Tralli's paper, ibid. 1805, p. 33; and Murray's paper, ibid. vol. i. From these papers we shall make the following abridged extracts, which seem necessary for the elucidation of the subject; and in the first place we shall state Mr. Murray's experiments.

Into a glass cylindrical vessel water was poured, till it covered the bulb of a thermometer; its temperature was 46°, which was likewise the temperature of the air of the room. One ounce of olive oil, heated to 140°, was poured on a small piece of cord, suspended on the surface of the water, and the cord was slowly withdrawn. Any motion of the water was thus avoided. In the course of a minute the thermometer began to rise slowly; in five minutes from the commencement of the experiment, it had risen 4°, in ten minutes 6°, in fifteen minutes 8°. It then became stationary, and continued so for seven minutes, before it began to fall. Its descent was slow. This experiment was repeated with a hot metallic ball (instead of oil) immersed in the water above the thermometer, and it was attended with a similar effect.

From these results the conclusion might seem just, that the fluid must possess a conducting power. Yet this is rendered doubtful by the circumstances, that in all experiments of this kind, a quantity of caloric must be conveyed by the sides of the vessel. In order to avoid this source of error, Mr. Murray employed a vessel of ice. But water could not be used in this case, because that fluid expands from 40° to 32°; therefore oil and mercury were used.

A quantity of almond oil was poured into the ice vessel, so as to cover the bulb of the thermometer a quarter of an inch. A small cylindrical iron cup, two inches in diameter, and having a flat bottom, capable of holding two ounces by measure, was suspended so as merely to touch the surface of the oil, and was filled with boiling water. At the beginning of the experiment, the thermometer stood at 32°. In a minute and a half it had risen to 32°, in three minutes to 34°, in five minutes to 36°, in seven minutes to 37°. At this point it became stationary, having risen 5° in seven minutes. The temperature of the water in the cup had in this time fallen to 96°. The thermometer, after remaining stationary at 37° for five minutes, began to fall, and it continued to descend at the rate nearly of a degree in a minute and a half, till it returned to 32°. The experiment was repeated with this variation, viz. that the thermometer was placed lower, so that half an inch of oil flowed over its bulb. It was also repeated with mercury instead of oil. But in both cases the results were similar to that of the first experiment.

"This rife," Mr. Murray says, "it appears to me impossible to ascribe to any other cause than to a power in the fluid to conduct caloric. Thus it is evident, that the sides of the vessel cannot convey to the fluid in contact with the bulb of the thermometer any part of the caloric it received. Ice, in common with any other solid, may, at temperatures below its melting point, conduct caloric; but as it cannot possibly exist with a temperature above 32°, it cannot communicate any temperature above that to a fluid in contact with it, and consequently it would not contribute in the above experiment to raise the thermometer above that temperature. Caloric does not radiate through transparent fluids, and it cannot even be supposed capable of passing by radiation through an opaque fluid as mercury.

If it be proved that oil and mercury are capable of conducting caloric, it will be admitted as sufficiently probable, that other fluids may have a similar power. Of these two, mercury, it is probable from these experiments, is the better conductor, as the rise of the thermometer took place in it much more rapidly than in the oil. Dr. Tralli's experiments for ascertaining the conducting powers of divers fluids, were performed in the following manner:

A cylindrical vessel was turned out of wood, having its sides half an inch thick, its height four inches and its diameter two. It has a moveable wooden top or cover, perforated with a hole in its centre, a little more than an inch in diameter, into which an iron cylinder, of one inch in diameter, could be easily introduced. This cylinder is supported by a flight flange, or shoulder-piece, and can be taken up by means of a string attached to its top. When the iron bar is in its place, its flat lower extremity is half an inch distant from the bulb of a delicate mercurial thermometer, which is fixed by wax in a hole perforating the cylinder near its bottom. This thermometer is bent to a right angle, so that its bulb and part of its stem lie in the axis of the wooden cylinder. This shape was preferred, because the item could be little affected by the caloric transmitted by the sides of the vessel, till after the bulb was acted on by the caloric of the iron bar.

A variety of experiments was performed with this apparatus in the following manner: The temperature of the room being nearly 67°, Fahrenheit, during the trials, a kettle of water was kept boiling over the fire. Its temperature was between 211° and 212°, and this is the cylinder of iron was suffered to remain, at each experiment, for fifteen minutes. The liquid to be examined, and all the apparatus (but the iron bar) were at each experiment ascertained to be at 67°. The liquid was poured into the wooden vessel, till it could rise 1/5 of an inch on the side of the iron cylinder when in its place. The wooden top was put on, and the iron was drawn out of the kettle of boiling water by means of the attached string, and instantly let down through the hole of the cover. The time the thermometer took to rise through 3° (viz. from 67° to 70°) was accurately marked by means of a stop-watch, and the results of the experiments on several fluids, are exhibited in the following table.

<table>
<thead>
<tr>
<th>Liquids</th>
<th>Minutes</th>
<th>Seconds</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water</td>
<td>7</td>
<td>5</td>
</tr>
<tr>
<td>Cow-milk</td>
<td>8</td>
<td>25</td>
</tr>
<tr>
<td>Proof spirit</td>
<td>8 nearly</td>
<td></td>
</tr>
<tr>
<td>Alcohol. Lond. Pharmec.</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Transparent olive oil</td>
<td>9</td>
<td>50</td>
</tr>
<tr>
<td>Mercury</td>
<td>9</td>
<td>15</td>
</tr>
<tr>
<td>Solution of sulphate of iron.</td>
<td>8</td>
<td></td>
</tr>
<tr>
<td>Salt. Water</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Saturated solution of sulphate of alumine</td>
<td>9</td>
<td>40</td>
</tr>
<tr>
<td>Saturated solution of sulphate of foda</td>
<td>6</td>
<td>30</td>
</tr>
<tr>
<td>Aqua potass. pura. London Pharm.</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Saturated solution of sulphate of foda, but</td>
<td>19</td>
<td>20</td>
</tr>
<tr>
<td>the liquid not touching the iron cylinder, by 1/5 of an inch, or nearly 10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"If
"If I am not deceived," says Dr. Traill, "we may conclude, from what I have above adduced, that liquids, as well as solids, are conductors of caloric; that the transmission of it through them follows a particular law depending on the properties of the particular liquid; which is not in the exact ratio of any of their mechanical properties, though nearer that of their density, than any other.

A circumstance, deserving the attention of the speculative philosopher, respecting the conductors of electricity and of heat, has been observed; viz. that most of those bodies which are good conductors of the one, are likewise good conductors of the other. This law, however, is not without exceptions. Thus, metallic bodies are good conductors of both: but charcoal is a good conductor of electricity, though a very bad conductor of heat.

The last particular, which we shall briefly notice, with respect to the conductors of heat, is their use. This, on the lead examination, will be found to be very extensive. Nature and art avail themselves of these peculiar properties of bodies, and without them both animal and vegetable life could not subsist. The atmospheric fluid which envelops the earth, is a very bad conductor of heat, undoubtedly created for the purpose of not dissipating the heat of the earth and terrestrials bodics. The coverings of animals, such as furs and feathers, being extremely bad conductors, confine the heat on the animal body. The bark and ligneous part of plants, in consequence of their imperfect conducting powers, tend to prevent the freezing of vegetable juices. The industry of man has not omitted to use the worst conductors of heat for coverings, for the defence of his habitations, for the confinement of heat in certain furnaces, &c. In short, numerous and admirable effects are produced by Providence, and several efficient advantages are obtained by art, from a proper application of the various conducting powers of natural bodies.

Conductors, in the Military Art, are auxiliaries to the commissary of stores in conducting depots and magazines from one place to another. They take charge of the ammunition wagons in the field, make their reports to the commissary, and are under his authority and command.

Conductos ad præstitendum, in Law. See Cafras.

Conduit, a canal, or pipe, for the conveyance of water, or other fluid matter.

In the earth are several subterraneous conduits, through which the waters pass that form some Springs; and through which also pass the vapours which form Metals and Minerals.

Artificial conduits for water are made of lead, stone, cast iron, potter's earth. See Plumbery.

In the province of New Mexico, there is said to be a subterraneous conduit, in form of a grotto, extending six hundred miles in length. See Duct. Tubs, &c.

Conduit d'une Troops. A troop that marches has always an officer, who commands independently of the other officers that may accompany it.

Conduskeg, in Geography, a settlement of America, in the district of Maine and Hancock county, containing 557 inhabitants.

Condyliæ, in Ancient Geography, a town of Arcadia, near Caphia, and N.W. of Orchomenus. In this town was a temple of Dana, and near it a grove. Paufians.

Condyliæ, in Anatomy, an appellation bestowed on several portions of the bones.

Condylopa, from σδομο, s'di'ti articulæ, in Surgery. By this term is understood almost every hard excrescence or sarcoma, that appears in the parts about the anus and the pudenda of both sexes; which is generally pinxt, or at least troublesome, and sometimes of a venereal origin. According to the different forms which they acquire, they are termed condylopa, condyl.]"
care not to let any part of them come into contact with the rectum, which would produce very dangerous consequences. The extirpation by means of ligatures may be employed when the number of the excrescences is but small, and they hang by small stalks to the surface; for otherwise it is a painful remedy. The most certain method of removing them is by means of the knife, only they frequently grow again within a short time; nor ought this remedy to be employed in venereal cafes, till a sufficient quantity of mercury has been administered. In cutting them off, all the adjacent diseased parts must be taken away; and in order to prevent inflammation, the blood may be suffered to flow for some time, after which the parts may be covered with lint, and treated as a common wound.

CONDYLON, in Ancient Geography, a fortress of Greece, between Connas and Tempe, towards Thessaly.

CONE, in Geometry, a solid body, having a circle for its base, and terminated at the top in a point, or vertex. See Plate 1, Conics, fig. 4.

The cone is generated by the motion of a right line, KM, round an immovable point, K, called its vertex, along the circumference of a plane, called its base, MN; or it may be conceived as generated by the revolution of the triangle, KLM, about the right line, KL, which is called the axis of the cone, and KM its latus or side. If the axis be perpendicular to the base, it is said to be a right cone; and if inclined, or oblique, an oblique or slanted cone. Scalenous cones are again divided into obtuse-angled, and acute-angled.

An equalateral cone, is a right cone, whose side is equal to the diameter of the base.

Euclid defines a cone a solid figure, whose base is a circle, as CD (fig. 5.), and is produced by the entire revolution of the plane of a right-angled triangle CAD, about the perpendicular leg AB. If this leg, or axis, be greater than CB, half the base, the solid produced is an acute-angled cone; if less, it is an obtuse-angled cone; and, if equal, a right-angled cone.

But Euclid's definition only extends to a right cone; that is, to a cone whose axis is at right angles to the base; and not to oblique ones, whose axis is not at right angles to the base.

For a more general and comprehensive description of a cone, which may take in both right and oblique ones, suppose an immovable point A (fig. 6.), without the plane of the circle BDEC; and suppose a right line, AB, drawn through that point, and produced infinitely both ways, to be moved quite about the circumference of the circle; the two superficies that will arise from this motion are each called conic superficies; but, taken conjunctly, they are called superficies vertically opposite, or only opposite superficies. The immovable point, A, common to both the superficies, is called the vertex; the circle BDEC, the base; the right line AC, drawn through the vertex A, and C, the centre of the base, and if infinitely produced, the axis; and the solid, comprehended under the conical superficies and the base, is a cone.

Cone, Properties of the.—1. The area or surface of every right cone, excluding its base, is equal to a triangle whose base is the perimeter, and its height the slant side of the cone.

Take the very small arc IK (fig. 7.), and draw IA, AK. Then the part of the surface AIK coincides with the small isosceles triangle AIK, whose base is IK, and height AI. In like manner, the whole surface of the cone may be opposed to confit of such triangles whose common height is AI, and bases so many K's as are contained in the circumference of the base, all which triangles are equal to the triangle whose height is AI, and base, the sum of all the K's, or the circumference BKDB. Hence, the curve surface of a right cone is equal to half the rectangle of the side AB, and circumference of the base, BKDB. For the half of that rectangle is equal to a triangle of the same base and height. Moreover, the curve surface of a right cone is equal to a circle, whose radius is a mean proportional between the side AB, and the radius of the base BC. For the conic surface is \( \frac{AB \times BKDB}{2} \), and the area of the base BD = \( \frac{BC \times BKDB}{2} \) (see Circle).

Let the radius, R, represent the mean proportional between AB and BC, or let \( R = \sqrt{AB \times BC} \); and the area of the whole radius is \( R = A \). Then the conic surface = circle BD :: \( \frac{AB \times BKDB}{2} \) = circle A :: \( AB \times BC \). Hence, also, the curve superficies of a right cone is to the area of its circular base, as AC (fig. 5.), the length of the hypotenuse of the right-angled triangle describing it, is to CB, the base of the fame triangle; that is, as the slant side of the cone, to the semidiameter of the base.

Hence also, the surface of a right cone is equal to a sector of a circle described on the slant side of the cone, as a radius, whose arc is equal to the semidiameter of the base of the cone; and has therefore the fame proportion to its semidiameter, which the diameter of the base has to twice the side of the cone. Hence we have a method of describing a rete or cage that shall just cover a cone.—Thus, with the diameter of the base AB (Plate, Conics, fig. 8.), describe a circle, and produce the diameter to C, till AC be equal to the side of the cone. To 2 AC and AB, determined in numbers, and 360°, find a fourth proportional: and with the radius CA, on the centre C, describe an arc DE equal to the number of degrees found: the sector CDE with the circle AB will be a rete for the right cone.

If, then, the side of a truncated cone be set off from A to I, and an arc GH be described with the radius CF; by finding a fourth proportional to 360°, to the number of degrees of the arc GI, and to FC; and thence determining the diameter of the circle IF, we shall have a net or cover of the truncated cone.

For CDBAE is a net for the entire cone; CGFII for the cone cut off; therefore, DBEHIG for the truncated cone.

2. Cones and pyramids, having the same bases and altitudes, are equal to each other.

Now, it is shown, that every triangular prism may be divided into three equal pyramids; and therefore, that a triangular pyramid is one third of a prism, standing on the same base, and having the same altitude.

Hence, since every multangular body may be resolved into triangular ones, and every pyramid is a third part of a prism, having the same base and altitude; since a cone may be esteemed an infinite-angular pyramid, and a cylinder an infinite-angular prism; a cone is a third part of a cylinder, which has the same base and altitude. Hence, cones of equal bases are as their heights; cones, and also frustums of cones, of equal altitudes, are as the bases: cones are to one another in the compound ratio of the bases and heights; and in equal cones, the bases and heights are reciprocally proportional.

3 A 2. Hence
Here we have a method of measuring the surface and solidity of a cone. Thus, for the solidity: find the solidity of a prism, or cylinder, having the same base with the cone, or pyramid, or, multiply the base by the altitude; then divide by : the quotient will be the solidity of a cone, or a pyramid. Thus, if the solidity of a cylinder be $60552660$, the solidity of the cone will be found $201794320$.

For the surface: that of a right cone is had by multiplying the semi-periphery of the base into the side, and adding the product to the base.

All cones, which have their altitudes and the diameters of their bases reciprocally proportional, are in the triplicate ratio of their altitudes, being each to other in the same proportion with prisms of equal base and altitude, of which they are like parts. See Prin.

Suppose, e. g., the diameter of the cone $NM$ (fig. 4) 36, the periphery will be $17550266$, and the base $24530144$. Suppose the altitude or axis $KL$, 246; since $LM = \frac{3}{4}$ $NM = 28$, and $KM = KL = 6056 + 784 = 61300$, $KM = 24755$, &c. Consequently the superfiences of the cone, exclusive of the base, is $21771388$; and the whole together $242433224$.

The solidity of an oblique cone is obtained in the same manner with that of the right cone: but it is much more difficult to find its surface, since it cannot be reduced to the measure of a factor of a circle, because all the lines drawn from the vertex to the base are not equal. See a Memoir on this subject, by M. Euler, in the Nouv. Mem. de Pæthburn, tom. i. Dr. Barrow has demonstrated, in his Lectiones Geometricæ, that the solidity of a cone with an elliptic base, forming part of a right cone, is equal to the product of its surface by a third part of one of the perpendiculars drawn from the point in which the axis of the right cone intersects the ellipse; and that it is also equal to one third of the height of the cone multiplied by the elliptic base; and therefore that the perpendicular to the height of the cone, as the elliptic base to the surface.

For the measure of the surface, and solidity of a truncated cone, or frustum, $ABCD$ (fig. 8). Its altitude $CH$, and the diameters of its bases $AB$ and $CD$, being given, find their circumferences; to the square of the altitude $CH$, add the square of the difference of the radii $AH$, and from the aggregate extract the square root, which will give the side $AC$: the semi-sum of the peripheries, multiplied by that side, gives the superficies of the truncated cone or frustum.

To find the solidity: as the difference of the semi-diameters $AH$, is to the altitude of the truncated cone or frustum $CH$, so is the greater semi diameter $AP$ to the altitude of the entire cone $EF$. This being found, subtract the altitude of the truncated cone $GF$, which will leave that of the cone taken off, $EG$. Find the solidity of the cone $CED$ and $AEB$; subtract the other from this; the remainder will be the solidity of the truncated cone $ACDB$. Or, add into one sum the areas of the two ends of the frustum and the mean proportional between them; multiply that sum by the perpendicular height, and \(\frac{3}{4}\) of the product will be the solidity. For the method of finding the surface and solidity of a cone, &c. by fluxions; see Superficies and Solidity.

**Cone, Ungula of.** See Ungula.

For the sections of the Cone, see Conic section.—For the ratio of Cones and Cylinders. See Cylinder.—For the centers of gravity and of oscillation of a Cone, see Center.

Cone of the higher kinds, are those whose bases are circles of the higher kinds; and are generated by supposing a right line fixed in a point, on high, though conceived capable of being extended more or less, on occasion; and moved or carried round the said circle of the higher kind.

Cone of rays, in Optics, includes all the several rays which fall from any point of a radiant, on the surface of a glafs.

Cone, abline, or spindie, in Mechanics, is a solid formed of two equal cones joined at their bases. If this be laid on the lower part of two rulers making an angle with one another, and elevated above the horizontal plane, it will move towards the raised ends, and seem to ascend, though it really descends. Let $ABD$ (Plate XVI. Mechanics, fig. 7) be a common base of the two cones: its centre $C$ will be the centre of gravity of the whole solid: therefore, if $DF$ represents one of the rulers elevated to an angle $FDG$, whose sine $FG$ is less than the semidiameter of the cone $CD$, it is plain that the centre of gravity $C$ at the position of the cone $D$, is more distant from the centre of the earth, to which all heavy bodies tend, than in its position between the legs of the ruler at $F$; and therefore it will descend, as on an inclined plane $CFE$, from $C$ to $F$, where it will stop, being supported on the raised ends of the rulers.

Cone, in Affixing. See Melting-cone.

Cone, in Botany, a hard dry seed-veil of a conical figure, co-mitting of several woody parts; and is, for the most part, fealy, adhering clofsly together, and separating when ripe.

Cone-flone, in Natural History, the name given by many to a species of Turbulus marinus, not known to us in its recent state, but frequently found fossil in the Swedish flones used in pavements.

Cone, and key. Bradton, lib. ii. cap. 37. num. 7. says, Fumina in tali estate (i.e. 14. or 15. annorum) potest disposita donum facer, et habere cone et key.

The words come from the Saxon cova, i. e. calculate, and key, elvis; so that a woman was then held to be of competent years when she was able to keep the accounts and keys of the house: and Gram. lib. viii. cap. 9. has somewhat to the same purpose.

Cone, in Conchology. See Conus.

CONESTE, Thomas de, in Biography, a monk of the order of the Carmelites, born in Bretagne, towards the close of the fourteenth century, and distinguished as the most popular and imprefive preacher of his time. In his discourses he did not confine himself to subjects of religion and morality, but he attacked with vehemence the reigning follies and fashionable foibles of the age. The head drefs of the ladies in particular was the subject of his repeated remonfances. At this period, says Bayle, "the head-dresses were of such a prodigious height, that the highest top-knots now are but dwarfs to them." Coneste reformed the women, and obliged the ladies to drefs themselves more decently and with a flrtct regard to decorum. It was not, however, so much by the force of the reasons with which he represented the evangelical duties, as by exciting boys and the commonalty to infult those of the other sex, who would not introduce a reformation into their dress. Whether, however, he aimed at vice or folly, he was so famed as an orator, that no churches were sufficiently spacious to contain the crowds, that followed him wherever he went; he therefore chose as the display of his eloquence, public squares and other places where immense scaffolds were erected, from which he could make himself heard by many thousands.
funds at the same time. When he travelled from place to place, it was on a mule attended with many monks and priests on foot. As soon as he arrived in the vicinity of any town, the most considerable persons for rank and property came out to meet him, in order to conduct him to the house provided for his lodging, which was commonly the best in the place. His labours were not confined to his own country; from France he proceeded to the Netherlands, and Italy, exciting everywhere the same attention which he experienced in his native land. At Venice he gained so much reputation, that the embassadors from that republic to the pope, invited him to accompany them to Rome. But the freedom and spirit of his declamations against the corruption of the clergy and the court, roused the resentment, and passions of the papal state; he was accordingly tried and condemned for heresy, and burnt at Rome in the year 1434. His motives were questioned by some of his contemporaries, but the readiness with which he submitted to a cruel death, in defence of his conduct, rather than retract the charges which he had exhibited against the profaneness of the Romish hierarchy, was sufficient evidence of his sincerity in a good cause. Baily.

CONEGLIANO, Gio Battista Cima, called II. from the vicinity of that city, a small city in the state of Venice, became, under the patronage of Giovanni Bellini, a painter of considerable eminence; and indeed so entirely did Conegiano polish himself of the style of Bellini, that the works of the scholar are frequently confounded with those of the master; even by good judges. It was however much the custom with the older Venetian painters to subscribe their names to their works; many therefore of this artist are still known, as well by the inscription as by the mountainous view of the town of Conegliano with which he usually enriched his back grounds. A juvenile performance of this master with the date 1491, is in the duomo of Conegliano: a more excellent picture by him is in the church of Santa Maria dell' Orto, at Venice. It represents St. Peter, St. Paul, St. Mark, and St. Jerome, with a magnificent architectural background. But in the opinion of Lanzi, the chef-d'œuvre of Conegliano is an altar-piece in the duomo at Parma, the subject of which however he has neglected to mention. This master is supposed to have died shortly after 1517. Lanzi. Storia Pittorica. Zanetti. Pittura Veneta.

CONEGOCHEAQUE CREEK, in Geography, a creek of America, which runs near Martinsburg, in Franklin county and state of Pennsylvania, runs southerly in a winding course, and after supplying a number of mills, discharges itself into the Potowmac at William Port, in Washington county, Maryland; 19 miles S.E. of Hancock, and 8 miles S. of the Pennsylvania line.

CONEI or CONE, George, a native of North Britain, and a zealous catholic, went to reside at Modena, in Italy, at an early age. He afterwards settled at Rome, and was celebrated, during the pontificate of Pope Paul V., for his profound knowledge of the Greek and Latin languages. His own good character recommended him to the patronage of the cardinals Montalto and Barberini. The latter being nephew to pope Urban VIII., Conei soon obtained so much of the favour and confidence of the pontiff as to be entrusted with the office of nuncio to Maria Henrietta, queen of England, which he discharged completely to the satisfaction of the papal court. As a reward for his conduct he would have been raised to the dignity of cardinal, had not death cut off his prospects. He died in 1640, at the age of forty-two; leaving behind him, among other works of merit, "The Life of Mary Stuart," "De Institutione primiis," "De Duplici Statu Religionis apud Scotos," &c. &c.

CONENGAUGH RIVER, and Little Conenough, in Geography, are the head waters of Kilkenmaraas, in Pennsylvania. After passing through Laurel hill and Cheat ridge, Conenough takes that name, and discharges itself into the Alleghany, 29 miles N.E. of Pittsburgh. It is navigable for boats, and there is a portage of 18 miles between it and the Franklin branch of Juniata river. -- Also, a town of Pennsylvania, 15 miles E. of fort Ligoner.

CONENOS, Las, a city of La Plata or Paraguay, in South America, in the diocese of Buenos Ayres.

CONEPATL, in Zoology, an American animal of the weasel kind mentioned by Herand., and also by Ray under the title of Trigipata. It is described as being a strong resemblance to the racoon in shape, but variegated with two long flocks of white, one on each side of the ridge of the back, which run even into the tail. This animal is laid to be of a harmless disposition, but of a skilling smell, and when pursued, or provoked, will discharge its excrements at the person who offers it to fix or eight feet distance; these have a very bad smell and spoil peoples clothes by leaving invisible yellow spots on them. Little is known of this animal than is above related. It inhabits New Spain, and was placed by Linneus in his Systema as the same species with his Vivera Memphitus, the memphitic weasel, and chinese of Buffon. Gmelin considers it as a distinct species, and describes it specifically under the name of conepat. This animal may prove to be a variety only of the fratercul weasel, or perhaps only of the memphitic weasel to which Linneus at first alligned it. See Vivera.

CONEFFREIT, in Geography, a town of Germany, in the circle of Bavaria, and Upper Palatinate; 34 miles N.N.E. of Amberg.

CONESI, or CONETI, in the Materia Medica, a bark brought from the East Indies. It is frequent in Ceylon, and Malabar, where the natives take it in diarrheas, linteries, and dyentaries. We use it in powder for the same purposes, the dose being from half a dram to a dram. It is proper to give a dose of ipecacuanha before taking it.

This tree grows also on the Coromandel coast, in the East Indies, and is not unlike the radgeopa of the buttus Malabaricus. The bark should be fresh powdered, and the electuary prepared with syrup of oranges every day or every other day. Med. Eff. vol. iii. art. 4.

CONESTEO, in Geography, a north-western branch of Tioga river in the state of New York, America.

CONESTOGA, a township of America, in the county of Lancaster and state of Pennsylvania.

CONESUS, a small lake of America, in the county of Genesee and state of New York, which conveys its waters N.W. to Genesee river.

CONFESSION, a ceremony among the ancient Romans, used in the marriage of persons whose children were destined for the honour of the priesthood. Confession was the most facet of the three modes of contracting marriage among that people; and confided, according to Servius, in this, that the pontifex maximus and flamen dialis joined and contracted the man and woman, by making them eat of the same cake of salted bread; whence the term, for signifying meal or flour.

Ulpian says, it confided in the offering up of some pure wheaten bread; rehersings, at the same time, a certain formula,
CON

formula, in presence of ten witnesses. Dionysius Halicarnassian adds, that the husband and wife did eat of the same wheaten bread, and threw part on the victims.

CONFECTION, in Pharmacy, a kind of compound remedy, of the confipence of a soft electuary, or electuary.

Confections and electuaries are composed chiefly of powders, mixed up with sirups or honey, into which the confection, that the powders may not separate by keeping. They are chiefly the milder medicines, and such as are not very ungrateful to the palate, that enter into the composition of the electuaries; for as they are taken somewhat "ad libitum," it would be unsafe to trust this mode of exhibition of the more active drugs. The lighter powders require about twice the weight of sirup to be brought to the proper confidence of an electuary. The ordinary dose is a piece about the bulk of a nutmeg. See ELECTUARY.

Several electuaries were formerly designated by the name of confections; some of which, in the medical language, are corroborative, and others purgative.

Of the number of the corroborative confections, were those of alkerms, of hyacinth, and the anacardium: a purgative one is the confection Hamech. The confection of alkerms has its name from the principal ingredients therein; which is the kermes, or alkerms, or scarlet-grain. The other ingredients were pearls, muka, cinnamon, ambergis, leaf-gold, juice of pippins, and rose water. It was ranked among the belt cardias, and frequently used for the palpitation of the heart, or scyndome; and sometimes in the small-pox and scrofula.

The confection of hyacinth was said to have nearly the same virtues with that of alkerms; but, besides, it was frequently used as an alaragent. It consisted of nearly triple the number of drugs; whereof the precious stone, called the hyacinth, was esteemed the principal; the chief of the rest were, red coral, bole armonica, terra nigrita, myrrh, the fanta, burnt hartthorn, camphire, faphire, emerald, topaz, and most of the ingredients of the confection of alkerms. The anacardium confection was composed chiefly of anacardium; whence the name. The other drugs were long pepper, black pepper, most kinds of myrobalans, salicorum, &c. It was used to purge the blood, and deemed proper in cold diseases.

The confection Hamech, took its name from that of its inventor, an Arabian physician. Its ingredients were, poly-poly, myrobalans, agaric, fenna, tamaraminds, red roses, manna, colocynth, &c. It was applied as a draffic for the purging of the grosser humours and viscidities; it was also of some reputation in vertigoes and cancers. But all these, though we have thought it proper to mention them, are excluded from the modern dispensatories.

CONFECTION aromatic. See the next article.

CONFECTION cardiae, a name given in the late London Dispenfatory to the so much esteemed medicine commonly known by the name of the confetia Raleighana, and now denominated confection aromatic. The composition is also altered, as well as the name, and is ordered now to be made in the following manner: Take zedoary, in coarse powder, and miferon, of each half a pound, and of distilled water, three pints. Macerate for twenty-four hours, and then press out and strain. Evaporate the strained liquor to a pound and a half, and add of compound powder of crabs-claws, sixteen ounces by weight; cinnamom and nutmeg, of each two ounces by weight; cloves, one ounce by weight; lesser cardamom, half an ounce by weight; and double refined sugar, two pounds.

Powder the spices together very finely, and adding the sugar, make a confection. This is an improvement of the confection cardia of the former dispensatory. The essential oil of the cardamon appeared, on an experiment made at the Hall, to be lost in the evaporation of the tincture; and, therefore, the cardamon is now more properly added in powder.

CONFECTION Darmocratis. See Mithridate.

CONFECTION Frasylir. See Discordium.

CONFECTION Japonica, was prepared of Japa earth, three ounces; tormentil root, nutmeg, and olibanum, of each two ounces; opium, dissolved in Lisbon wine, a dram and a half; simple sirup and conserve of roes, of each fourteen ounces. An electuary of these ingredients supplied the place of discordium; and the dose was from a scruple to a dram.

CONFECTION Opia, confection of opium, is prepared in the following manner: Take of hard purified opium, powdered, six drams by weight; long pepper, ginger, and caraway, of each two ounces by weight; sirup of white poppy, boiled to the confidence of honey, three times the weight of the whole. Mix the purified opium with the heated sirup, and add the rest in powder.

CONFECTION Paulina, a name given in the late London Dispenfatory to the composition which used to be called confection archigenis. It was ordered to be made in the following manner: Take curds or zedoary, cinnamon, long pepper, black pepper, strained flowers, galbanum, opium, and Ruffin calfor, of each two ounces; of simple sirup, boiled to the confidence of honey, an equal weight to thrice the species. Pemberton's London Pharm. p. 317.

CONFECTOR, among the Ancient Romans, a sort of gladiator, hired to fight in the amphitheatre against beasts; hence also denominated bestris. See GLADIATOR.

The confectioners were thus called a confectionis bestris, from their dispatching and killing beasts.

The Greeks called them mepodot, q. d. daring, robust, desperate; whence the Latins borrowed the appellations parabolani, and parabolarii. The chariots were sometimes condemned to this sort of combat.

CONFECTS, or CONFECTIONS, a denomination given to fruits, flowers, herbs, roots, and juices, when boiled and prepared with sugur, or honey, to disposte them to keep, or render them more agreeable to the taste.

The ancients only confection with honey; at present, sugar is more frequently used. Confects half-fugared are those only covered with a little sugar, to leave more of the natural taste of the fruit.

Confects are reduced to eight kinds; viz. liquid confects, marmalades, jellies, pastes, dry confects, conserve, candies, and drages, or sugar plums.

Liquid confects are those whole fruits, either whole, in pieces, in seeds, or in chippers, are conficled in a fluid transparent sirup, which takes its colour from that of the fruits boiled in it. There is a good deal of art in preparing these well; if they be too little sugared, they turn; and if too much, they candy. The most esteemed of the liquid confects are plums, especially those called mirables, barberries, quinces, apricots, cherries, orange flowers, little green citrons from Madeira, green callya from the Levant, myrobalans, ginger, cloves, &c.

Marmalades are a kind of pastes almost liquid, made of the pulp of fruits, or flowers, that have some confidence; such as apricots, apples, pears, plums, quinces, oranges and ginger. Marmalade of ginger is brought from the Indies by way of Holland: it is esteemed good to
to revive the natural heat in old men. See Marmalade.

Jellies are juices of several fruits, wherein sugar has been dissolved, and the whole, by boiling, reduced into a pretty thick consistence; so as, upon cooling, to form a kind of thin transparent glue, or paste. Jellies are made of various kinds of fruits, especially gooseberries, currants, apples, and quinces: there are other jellies made of beet, rhubarb, &c. but they are not to be kept, being very subject to corruption. See Jelly.

Pudding is a kind of marmalades, thickened to that degree by a proper boiling, as to assume any form, when put into little moulds, and dried in the oven. The most in use are those of gooseberries, quinces, apples, pears, and orange flowers: those of pillachoes are the most esteemed; those of ginger are brought from the Indies.

Dry Confiters are those whole fruits, after having been boiled in the syrup, are taken out again, and drained, and put to dry in an oven. These are made of so many kinds of fruits, that it would be hard to explain them all: the most considerable are citron and orange-peel, plums, pears, cherries, apricots, &c.

Confiters are a kind of dry confecys, made with sugar, pastes of flowers or fruits, &c. The most usual among these, are those of roses, malows, rosenmary; of heps, of orange flowers, violets, jefamin, pillachoes, citrons, and floes.

Note. The apothecaries, under the title of confevers, comprehend all kinds of confecys, both dry and liquid; whether of flowers, fruits, seeds, roots, barks, or leaves, prepared with sugar or honey, to preferve, &c. See Confever.

Candles are ordinarily entire fruits, candied over with sugar, after having been boiled in the syrup; which renders them like little rocks crystallized; of various figures and colours, according to the fruits enclosed within them. The best candys are brought from Italy. See Candy.

Sugar-plums are a kind of little dry confecys, made of small fruits or seeds, little pieces of bark, or odoriferous and aromatic roots, &c. inclosed and covered over with a very hard sugar, ordinarily very white. Of these there are various kinds, distinguished by various names; some made of rabbberries, others of barberries, melon-seeds, pillachoes, filberts, almonds, cinnamon, orange-peel, coriander, aniseeds, caraways, &c.

CONFERENCES of Poland. See Poland.

CONFEDERACY, Fr. Confederation; an alliance, compact, or league between different princes and states, for the support of a common cause. See Confederation.

Confederacy, in Latin, is when two or more persons combine to do any damage to another, or to commit any unlawful act.

Confederacy is punishable, though nothing be put in execution: but then it must have these four incidents; 1. That it be declared by some matter of prosecution; as by making of bonds or promises to one another; 2. That it be malicious, as for unjust revenge; 3. That it be false; i.e. against the innocent; and, lastly. That it be out of court, voluntarily. See Conspiracy.

CONFEDERATE Troops, troops of different nations united together in one common cause against an enemy.

CONFEDERATION of the Rhine, in French la Ligue du Rhin, is the act by which several German states, situated between the Rhine and the Mayne, separated themselves from the Germanic body, and associated as confederated states of the Rhine, under the protection of the French empire. The instrument of this confederation was signed at Paris, on the 12th of July 1806, and the ratifications were exchanged at Munich on the 23rd of the same month. The contracting parties were the emperor of the French, on the one part, and on the other, the kings of Bavaria and Württemberg, the archbishops of Ratibson as prince possesses the grand dukes of Baden, Berg, Hesse Darmstadt, and Nassau, and Napoleon, the prince of Baden, Hesse-Cassel, Hesse-Hanau, Hesse-Darmstadt, Hesse-Cassel, Nassau, and Nassau-Frankenstein, the prince of Nassau, and the prince of Lein. They declared that they would admit other German princes and states to this confederation where their union with the confederation might be considered as a difficult with the general interell, and thus virtually annulled the inconsiderable part that was left of the German empire. This induced Francis II., last emperor of Germany, and his fl. of Austria, formally to abdicate the German empire, by his proclamation of the 6th of August 1806. It was then expected that a similar confederation would be formed on the north of the Mayne under the protection of either Prussia or Russia: but the king of Prussia having declared war against France, in October 1806, and having been completely overthrown at the battle of Jena, on the 14th of the same month, several other German states hastened to join the confederation of the Rhine, as Lippe-Detmold, Schaumburg-Buckeburg, Saxony-Weimar, Saxe-Coburg, and the newly created kingdom of Saxony. By the peace of Tilsit, which cedes the Prussian provinces on the right bank of the Elbe, and the possessions of Heffel-Cassel, Orange-Olda, and other petty German states into a new kingdom, to be called the kingdom of Weilphalia, the confederation of the Rhine is extended to the banks of the Elbe, and will probably receive considerable modifications from such a large and important accession of new members. Its original stipulations were that the confederated states

Art. I. are for ever separated from the Germanic body, and united by a particular confederation, under the designation of the "Confederated States of the Rhine."

II. Renounce the laws; and

III. The titles of the empire.

IV. The elector arch-chancellor takes the title of prince primate and most eminent highness, which title shall convey no prerogative derogatory to the entire sovereignty which every one of the contracting parties shall enjoy.

V. The elector of Baden, duke of Berg, and landgrave of Heffel-Darmstadt, take the title of grand dukes; the chief of the house of Nassau that of duke; and the count of Leyn that of prince.

VI. The affairs of the confederation shall be discussed in a congress at Frankfort on the Main; divided into two colleges, that of the kings and that of the princes.

VII. The members of the league must be independent of every foreign power. They cannot enter into any other service but that of the states of the confederation and its allies. Those who have been in the service of a foreign power, and choose to continue in the same, must abdicate their principalities in favour of one of their children.

VIII. Any prince he disposed to alienate the whole or any part of his sovereignty, he can only do it in favour of a confederate.

IX. All disputes are settled in the assembly at Frankfort, where

X. The prince primate prudens. But if the two colleges deliberate
deliberate separately, he presides in the college of kings, and the duke of Nassau in the college of princes.

XI. The fundamental statute is to be framed by the prince primate.

XII. The French emperor is protector of the confederation, and names the successor of the prince primate.

XIII. to XXI. Enumerate the cessions made by members of the league: thus, Nassau cedes to Berg the town of Deutz and its territory; Bavaria acquires the imperial city of Nuremberg and its territory; and

XXII. The prince primate receives Frankfort on the Main, and its territory, as his property.

XXIII. and XXIV. Enumerate the lordships over which the members of the confederation exercise the rights of sovereignty.

XXV. They also enjoy the sovereignty over the imperial kingdoms included within their boundaries.

XXVI. The rights of sovereignty confind in legislation, administration of justice, military recruitment or recruiting, and levying taxes.

XXVII. Between the prince primate and the subordinate princes and counts, their domains cannot be sold or given to any prince out of the confederation, without being first offered to the prince under whose sovereignty they are situated.

XXVIII. These subordinate princes and counts preserve the privilege of being tried by their peers. Their fortune cannot be confiscated, but their revenues may be sequestered during the life-time of the criminal.

XXIX. and XXX. Regulate the payment of debts.

XXX. The subordinate princes or counts may take up their residence where they choose, and draw their rents or capitals without any revere.

XXXI. Public functionaries not retained by the new sovereign, receive a pension proportionate to the situation they held.

XXXII. The same takes place with respect to religious orders losing their income.

XXXIV. The confederates renounce all reciprocal claims except the eventual right of succession.

XXXV. Between the French emperor and the confederates there shall be federative and individually an alliance, by virtue of which every continental war in which either is engaged shall be common to all.

XXXVI. In the event of any power making preparations for war, the contracting parties, in order to prevent surprise, shall, upon the requisition of the minister of one of them at the assembly of the league, arm likewise. And as the contingent of the allies is subdivided into four parts, the assembly shall decide how many are to be called into activity. The armament, however, shall only take place upon the summons of the French emperor to each of the confederates.

XXXVII. The king of Bavaria binds himself to fortify Augsburg and Landau, and to form and maintain artillery and arming establishments in the said places.

XXXVIII. The contingent of each confederate is: France 200,000 men, Bavaria 90,000, Wirtemberg 12,000, Baden 5,000, Berg 5,000, Darmstadt 4,000, Nassau, Hohenzollern and others 4,000.

XXXIX. Admits of the accession of other German princes; and,

XL, as the concluding article, stipulates the exchange of the ratifications.

Of the two principal articles of the new constitution of the confederation of the Rhine, one relates to the establishment of a superior court of appeal, in which all cases between the sovereigns and their subjects shall be finally decided. The other stipulates that the manufactures of each state shall be allowed to be freely imported into all the other states of the confederation. Several new roads are to be made in order to facilitate commerce.

CONFERENCE, in its first and primary sense, denotes mutual discourse, and more especially such discourse on serious and important subjects. It also denotes an appointed meeting for discussing some point, by personal debate; of this kind was that held at Ratibon, in 1607, at the joint desire of Maximilian, duke of Bavaria, and Philip Lewis, elector Palatine, between some eminent Lutheran doctors on one side, and three celebrated Jesuits on the other. The dispute turned upon the two great points, to which almost all the contests between the Protestants and the Roman Catholics are reducible, viz. the rule of faith and the judge of controversies. In 1615, another conference was held at Neuberg between James Hellbroner, a learned Lutheran, and James Keller, a celebrated Jew, by the name of Wolfgang William, prince Palatine, who held till before that time embraced the Romish faith. But the most famous of all these conferences was that held in the year 1645 at Thorn, by the express order of Audibus IV. of Poland, between several eminent doctors of the Romish, Lutheran, and Reformed churches. As this meeting was intended to heal the divisions that prevailed among these churches, and to discover some method for healing their differences, and for effecting a reunion, it was on this account called the "Charitable conference." But the issue of this conference was very far from being favourable to the projected union. Some time after this, Ernef, landgrave of Helf, in order to give a plausible colour to his apostacy from the Protestant religion, and make it appear to be the result of examination and conviction, obliged Valerianus Magnus, a learned chaplain, to enter the lists with Peter Habercorn, a reformed minister, in the castle of Rheinfield. Besides these public conferences on the continent, there were others of a more private nature held, during the 17th century, between the doctors of the contending churches. The most remarkable of these was the famous dispute between John Claude, the most learned of the Reformed divines in France, and Jacques Besaigne de Bediffet, whose genius and erudition placed him at the head of the Romish doctors in that country. This dispute, held in the year 1683, terminated, like all the rest, in widening the breach instead of healing it. Neither of the contending parties could be prevailed to yield; but, on the contrary, they both returned from the field of controversy more rivetted in their own opinions, and more averse from those of their adversaries. Another conference was held at Leipzig, in 1631, between three Saxon doctors on the one side, and some of the most eminent divines of Helf-Cassel and Brandenburg on the other, with a view of representing, with fidelity and precision, their respective doctrines, and for the purpose of discovering the obliques which prevented the union of the Lutheran and Reformed churches. The conference, however, though amiably conducted, broke up without having contributed in any respect to promote the salutary work of peace. The conference held at Cassel in 1661, by the order of William IV, landgrave of Helf, between two professors at Rintelen, on the side of the Lutheran, and two others of the university of Marburg on that of the Reformed, was attended with much greater success than that of Thorn above mentioned: for, though it did not bring about a perfect uniformity of opinion, it produced an effect, which
was in reality, much better, a spirit of Christian charity and forbearance.

The most famous conferences of a similar kind, held in England, were those of Hampton-Court in 1604, and of the Savoy in 1661. The former was held by order of James I., on pretence of finding expedients, which might terminate the religious disputes between the church and the puritans, and reconcile both parties. The professed design of this conference was to examine the objections of the puritans against the doctrine, government, and discipline of the established church, and to rectify its abuses. But the progress and result of it evidently showed, that it was the design of the king to make an odious exhibition of his learning, and to mortify the puritans, who had favourable expectations from James's education in Scotland, and his professed attachment to the church established in that country, but who found, in the event, that he had conceived invincible prejudices against them. The disputants on both sides were nominated by the king. For the church, there were nine bishops, and about as many dignitaries; and for the puritans, there were only four ministers. This conference continued three days, viz. Jan. 14th, 16th, and 18th. The first day's conference was with the bishops and deans; the puritan ministers not being present; when the king made a speech in commendation of the hierarchy of the church of England, congratulated himself, that he was now come into the "promised land," &c. &c.; and informed them, that the reason of his confuting them by themselves was to receive satisfaction from them: 1. About some things in the Common Prayer. 2. Concerning excommunication in the ecclesiastical courts. 3. About providing some well qualified ministers for Ireland; that if anything should be found to be redressed, it might be done without their being confronted by their opponents. After some alterations of no great importance, agreed on between the king and the bishops, with regard to the confirmation of children, the abolition of the church, private baptism, and baptism by women, and excommunication for killer crimes, his majesty's subjects were satisfied; and thus ended the first day's conference.

On the second day, Jan. 16th, the four ministers on the side of the puritans, together with Patrick Galloway, minister of Perth in Scotland, and two bishops and six or eight deans on the other side, were convened. The king, seated in his chair, with his nobles and privy councilors around him, informed the puritanical ministers that he was ready to hear their objections against the establishment. Upon which Dr. Raynolds, one of their number, in the name of his brethren, humbly requested: 1. That the doctrine of the church might be preferred pure, according to God's word. 2. That good pastors might be planted in all churches, to preach in the same. 3. That the book of Common Prayer might be fitted to more increase of piety. 4. That church government might be sincerely ministered according to God's word. In the discussion of these points, Bancroft and the king took an active part. At the close of this day's debate, his majesty highly incensed at the complaints stated by Dr. Raynolds, told the ministers, that he found they were aiming at a Scots prebytery; "which," says he, "agrees with monarchy as well as God and the devil;" there Jack and Tom and Will and Dick shall meet and confute me and my council. Therefore I reiterate my former speech: "Le Roi s'aviera." Stay, I pray, for one year before you demand; and then, if you find me grow purer and fat, I may perchance hearken unto you. For that government will keep me in breath, and give me work enough. I remember how they used the poor lady, my mother, in Scotland, and me in my minor-
They were to continue four months from the 22d of March 1601, and then present the result of their conferences to his majesty under their several hands. When the conference opened on the 15th of April, some difficulties occurred about the proper mode of proceeding; some of the presbyterian party were for infiling only on a few matters of importance, judging that if these were gained, and an union followed, it might be more easy to obtain the others afterwards. But the majority, by the influence of Mr. Baxter, were for extending their desires to the utmost, and thought themselves bound by the words of the commission, to offer every thing which they thought might conduce to the peace of the church; but when they were put in mind, that the king’s commission gave them no power to alter the government of the church, nor to infile upon archbishop Usher’s model, nor so much as to claim the concession of his majesty’s late declaration, they were much discouraged; for they were now convinced that all they were to expect were a few amendments in the liturgy and Common-Prayer Book. They wished also to have consulted their abettion brethren, and to have received from them a commission in form; but this was denied. Instead of drawing up a few supplemental forms and making some amendments to the old liturgy, Mr. Baxter composed a new one, in the language of scripture, which he called “The Reformed Liturgy;” not with a design entirely to set aside the old one, but to give men liberty to use either according to their own choice and approbation. This was presented to the bishops in the conference, together with exceptions to the “old liturgy.” This gave great offence, partly because a liturgy, composed by a single person in fourteen days, was set in competition with one which had been received in the church for a whole century; and partly, because it was inconsistent with the commission, and the bishops’ declaration of varying no further from the old standard than should appear to be necessary; and, therefore, the reformed liturgy was rejected at once without examination. When the presbyterians presented their exceptions to the liturgy, they accompanied them with “a petition for peace,” beseeching the bishops to yield to their amendments; to free them from the subscriptions and oaths in his majesty’s late declaration, and not to insist upon the re-ordination of those who had been ordained without a dioecesan bishop, nor upon the surplice, the cross in baptism, and other indifferent ceremonies, enforcing their petition by various arguments and motives. These exceptions were canvassed, and produced a variety of alternate objections and replies. The bishops, however, would make no concession to the prejudices of the presbyterianists; upon which they sent them a large expostulatory letter, in which, after having repeated their objections, they lay the wounds of the church at their door. The term for the treaty being almost expir’d in a paper controversy, about 10 days before the commission expired, a disputation was agreed on, to argue the necessity of alterations in the present liturgy. Three of each party were chosen to manage the argument. The dispute, however, terminated without effect. From arguments the presbyterian ministers defended to interessees, and befought the bishops to concassionate ferocious minds, and not to delibe their weaker brethren; to all which the bishops replied, that they were only commissioned to make such alterations in the liturgy as should be necessary, and such as should be agreed upon. Mr. Baxter says, that the bishops would not abide the small act ceremony, nor correct the grosser error, for the peace of the church. Thus the king’s commission expired July 25, and the conferences ended without any prospect of accommodation. It was agreed at the conclusion, that each party might represent to his majesty, that they were all agreed upon the ends of the conference, which were the welfare, unity, and peace of the church, but still disagreed as to the means of procuring them. The bishops thought they had no occasion to reprecipitate their plea in writing, but the presbyterian commissioners met by themselves, and drew up an account of their proceedings, with a petition for that relief which they could not obtain from the bishops. Hume’s Hist. vol. vi. 16. 13., vol. vii. 369.


Gen. Clar. Fibres simple, uniform, capillary, filamentous. Linn. “Filaments capillary, simple or branch’d, jointed; joints numerous, often unequal.” Lam. Vent. “Seeds produced within the substance of the capillary or jointed frond, or in closed tubercles united with it.” Dr. Smith.

Species. 1. Simple.

* Lambeifed.

1. C. conferticola. Conferua upon conferva. Dillw. conf. Dill. Mufc. 552. tab. 85. fig. 21. “Filaments simple, minute, somewhat crowded, acute; partitions obscure; joints cylindrical, unequal in length.” Dillw. Filaments rarely more than an eighth of an inch long, of a dark glaucous colour, tapering, Common in the latter months of autumn on various fuel and conferve. 2. C. fucata. Dillw. 49. “Filaments simple, very slender, minute, fuscous; partitions transparent; joints very short.” Growing in loose patches of a green colour, about half or three fourths of an inch long. Joints scarcely half so long as broad. Parataxic on conferve, and the smaller fuel in the neighbourhood of Swansea. 3. C. ficuloida. Vellely Mar. Plant. Pl. 4. Dillw. C. Withen. 4. 156. “Filaments cluttered, simple, obtuse; partitions transparent, slightly contracted; joints rather long.” Dillw. Filaments very numerous, thickly clustered at the root, diverging while in the water, from four to fix lines long, of a dirty yellow or brown colour, somewhat glossy when dried. Joints about twice as long as broad, filled with minute granules. Parataxic on fucum, and sometimes on nodous. 4. C. curta. Dillw. 76. “Filaments cluttered, simple, somewhat cartilaginous or horny, erect, short, attenuated at both ends; partitions transparent, slightly contracted; joints rather short.” Filaments seldom more than three or four lines long, of an olive-brown colour, obtuse, growing in roundish tuftt fusts. Joints not much longer than thick. Parataxic on fuci. 5. C. carnea. Dillw. 84. “Filaments simple, cluttered, somewhat knotty, flesh-coloured; joints rather short, attenuated at both ends; juice collected into solitary globules.” Filaments from a quarter to half an inch long, rather obtuse. Parataxis dark-coloured. Joints sometimes about twice the length of the diameter, sometimes little more than the length; colourless, except where the juice is collected. Parataxic in loose tufts on other conferve. 6. C. capillaris. Linn. Sp. Pl. 14. Linn. 14. Dill. p. 25. tab. 5. fig. 25. A. Dillw. 9. (C. limon, Flor. Dn. 771. C. palustris, live linum marimum Ancebus, Ral. Syn. p. 60. n. 16.) “Filaments simple, cylindrical, rather rigid, curled, entangled, brittle; partitions transparent; joints cylindrical, short; capsules fuscous.” Filaments three or four feet long, about the thickness of large thread, pale yellowish green, entangled, but never adhering together; perfectly acid after it has been exposed a few minutes to the
the air. Partitions quite transparent, with a thin blackish line on each side. Joints, when dry, generally appearing alternately compressed. Found in the ditches and flagrant pools of flat marches. 7. C. tortuosa. Dillw. 46. "Filaments simple, rather rigid, entangled, slender; partitions transparent; joints cylindrical, rather long." Reminiscent of the preceding species in miniature. Filaments as fine as human hair, less brittle than those of C. capillaris; joints nearly twice as long as broad. Found in salt-pools, and on rocks in the sea. 8. C. areu. Dillw. 80. "Filaments simple, rather rigid, nearly straight; partitions glabrous-transparent, contracted; joints oblone, short." Filaments several from the same root, from six to fifteen inches long, sometimes nearly the thickness of a crow's quill, generally about that of a large thread, dark or bluish-green, brittle. Joints not so long as broad, rounded at each end. On flakes in the sea.

†† In fresh water.

9. C. fasciculata. Dillw. 66. "Filaments simple, slender; partitions ring-like; joints rather long, transparent." Filaments very long, extremely slender, entangled. Joints about four times as thick as the slender tubes, and ditches frequent. In forests forming a semi-transparent cloud like mist round the grass or reed on which it grows, of a yellowish-green colour. In small currents, floating, in denier matts, on the surface. 10. C. inflata. Smith Eng. Bot. 1670. Conjugata inflata; Vaucher conf. 68. tab. 5. fig. 8. "Filaments simple; joints three times as long as broad; when fertile, swelling and elliptical." Filaments but the 720th part of an inch in diameter, transparent, almost colourless. Joints at first exactly cylindrical, marked with green colouring matter in spiral lines; afterwards swelling, elliptical, each protruding a lateral tube, so as to unite with similar tubes of a neighbouring plant. The colouring matter of one joint passes into the other, its spiral appearance being entirely lost. At length each joint which has received it swells still more, growing quite elliptical, and filled with a fold green body, which M. Vaucher has proved to be a single feed, producing in due time a solitary young plant. These appearances cannot be perceived without the aid of a microscope. Found by Mr. W. Borer at Henfield in Sussex. 11. C. pandurata. Dillw. 51. "Filaments simple, filigree; very slender; partitions obconic; joints rather short, cylindrical, joint above finally collected into foliaceous globules." Filaments from one to two inches long, so slender, as when single, scarcely to be distinguished by the naked eye. In ditches and pools not frequent. 12. C. bipunctata. Dillw. 2. Smith Eng. Bot. 1610. Roth Cat. Bot. ii. p. 204. (C. tellina; Muller in Nov. Act. Pet. iii.) "Filaments filiform, yellowish, joints short, cylindrical, with two spots." Joints remarkable in having each two dark spots, frequently furnished with a green longitudinal streak running through them; these spots sometimes fill nearly the whole, sometimes only a small portion of the joint, and, when upon varying decay, assume a flutted appearance, but are not visible without the aid of a microscope. 13. C. nitida. Dillw. 4. Flor. Dan. tab. 819. (C. vulgaris; Hufi. Flor. Ang. 176. C. teresia efferior & varie extensa. Dill. p. 13. tab. 2. fig. 2. C. decimina. Mull. nov. act. Pet. iii. C. setiformis; Roth. Cat. Bot. Flac. 1. p. 171. 2. p. 103. Byflas palustris confervor des. Mich. Gen. tab. 59. fig. 6.) "Filaments simple, shining, filigree; joints rather long, cylindrical; granules of the fructification doubly spiral." Filaments a foot or more long, about the thickness of a human hair, dark green, growing at the bottom of the water in loose irregular patches, not sufficiently matted as to contain air bubbles, nor so much entangled as in any others. 14. C. filaris. Dillw. 13. Smith Eng. Bot. 1616. Roth Cat. Bot. ii. p. 202. (C. guina; Mull. nov. act. Pet. 91.) "Filaments simple, filigree; joints cylindrical, rather long; granules of the fructification, spiral spirals." Filaments longer and more slender than those of nitida, anthetic like those of C. inflata. 15. C. jugata. Dillw. 5. Flor. Dan. tab. 883. (C. Scalaris; Roth. Cat. Bot. ii. p. 196.) "Filaments simple, filigree, often conjugate by pairs; granules of the fructification doubly spiral; finally collected into globules." In pools and ditches. Mr. Dillw. strongly suspects, that C. nitida (n. 13.), is only the present plant in an earlier period of its growth. 16. C. geniculata. Dillw. 6. Roth. Cat. Bot. ii. p. 199. (C. serpentina; Mull. nov. act. Pet. iii.) "Filaments simple, very slender, brittle, here and there knee-bent and conjugate; joints rather long, cylindrical; granules collected into lines." Filaments as far as can be judged, considering their brittle state, not more than one or two inches long, anathematic occasionally at very uncertain distances, and only where they are general, not regularly paired as in C. jugata, but connecting themselves with any other that is near them, and manifesting a strong affinity to the next species. In pools and ditches. 17. C. repanda. Linn. Sp. Pl. 1753. Smith Eng. Bot. 1658. Dill. p. 20. tab. 4. fig. 14. (Hydrodictyum; Vaucher Conf. 88. tab. 60.) "Filaments united into the form of a tubular net." Filaments green, tubular, forming a very delicate net, open at both ends; meshes generally with five sides, sometimes with four or fix. M. Vaucher found the old plants in a stationary condition during winter; but in spring the joints swollen, and gave out simple cylindrical masses of green matter. Each mass soon became a reticulate tube, which in two or three months grew to the full size of the parent plant. It grows loosely, floating in full water; but not very common. 18. C. crateriaris. Linn. Sp. Pl. 1. Linn. 1. Dillw. 79. Smith Eng. Bot. 1594. (C. compta; Roth. Cat. Bot. i. p. 170. C. florivialis sericea, vulgaris & fluviatus; Dill. p. 12. tab. 2. fig. 1. C. Pinni Rai. Syn. p. 58.) "Filaments simple, dark green, slender, very long, very densely compact, frequently twisted; joints rather short." Filaments often two or three feet long. 19. C. hasci. Dillw. 47. Smith Eng. Bot. 1655. "Filaments simple, slender, glaucescent, filigree; joints shortish; granules collected in small globules. Filaments kildum more than three inches long, tapering. On rocks and flakes in clear rapid rivulets. 20. C. diffusum. Dillw. 193. "Filaments simple, fringy, brittle; partitions but little contracted, often loose; joints short, with a dark spot in the middle." Filaments from three to six inches long, less than a human hair in diameter, dark green, often breaking at the partitions and remaining connected at one extremity; joints about half as long as thick. In ditches on reeds and other aquatic vegetables. 21. C. pecilialis. Dillw. 24. Smith, Eng. Bot. 1611. Mull. nov. act. Pet. iii. (C. bronchialis; Roth. Cat. Bot. i. p. 186.) "Filaments simple, transparent, broken, acuminate; partitions often loose; joints very short, crystalline-transparent in the middle." Filaments seldom half an inch long, dirty green, to the naked eye resembling decayed vegetable matter, when entirely gradually tapering to a point, and bearing some resemblance to the antennae of a lobifera, frequently breaking at the partitions, and remaining connected at one extremity. Joints appearing coloured at each end by a green fluid, which, as the plant approaches to decay, collapses, sometimes forming into small globular affers, and sometimes disappearing entirely. In rivers and flagrant waters, adhering to decaying wood and vegetables. 22. C. florulenta. Dillw. 8. Roth. Cat. Bot. i. p. 192. tab. 4. fig. 4. and tab. 5. fig. 6. "Filaments most commonly simple, minute; partitions loose; joints prismatic, alternately refract. ed." Filaments seldom more than a quarter of an inch long.
CONSERVA.

Varving from a pale to a greenish brown. Joints with a double line running through the middle, and frequently with some transversal bands; as they adhere to each other mainly in a single point, and always at alternate ends, they give the plant the appearance of a string of parallelograms, united at the corners. It might be taken for a much broken joint of C. pectinata, but the joints cannot be so divided as to form one regular line. In pools and slow streams, adhering to decaying vegetable and to other conservae, especially to C. glomerata. 25. C. foliata. Linn. Sp. P. 2. Lam. 2. Flor. Dan. tab. 651. [fig. 2.] Dilw. & C. (C. minima byfi foliata) Dilw. p. 14. tab. 12. fig. 30. Filaments simple, cylindrical, dark green, glaucous; partitions obtuse; joints very short.

Filaments without any apparent root, equally obtuse at both ends. Common in rivers, pools, and ditches, generally floating in loose masses on the surface. 24. C. limosa. Dilw. 20. (C. gelatinosa, omnium terrae et minima aquarum limo inane:; Dilw. p. 15.) "Filaments simple, very slender, rather mucous, compact, bluish green, flat; partitions indistinct." Common on the muddy edges of rivers, ditches, and ponds, resembling to the naked eye, except at the margin, where it is thinnest, a widely expanded, thin, seiflike gelatinous mass, sometimes floating at the top of the water. In either case only mode to examine it, is to carry it home, without allowing it to dry, and to put it in a pan of water, where, in the space of a night, it will swell out an immense number of threads, visible to the naked eye only from their number; these viewed through a microscope appear oblate at each end, and rough on each other without any regular order. Mr. Dilwyn is inclined to think that this is only the last species in a younger stage; the principal difference is in the size and colour; in C. foliata the filaments are much larger, broader, and not glossy; the joints also are far more divided, and more regularly disposed. 25. C. viridaca. Hudf. Flor. Ang. p. 592. (C. confugosa.) Lightf. Flor. Scot. p. 975. Dilw. p. 15. tab. 2. fig. 4. "Filaments simple, equal, violat." Filaments about half an inch long, of a beautiful violat or indigo colour, of a slippier mucous substance, so extremely fine as to be undistinguishable by the naked eye, and so crowded together as to form, when moist, a gelatinous mass, and when dry, a membranous lamina. Found by Lightfoot on the rocks in the waterfalls of the mountain of Goatfield in the Isle of Arran, and said by Dillenius to grow in Alpine rivulets near Llanberis. 26. C. obvoluta. Smith. Eng. Bot. 1578. "Glaucescent, flaccid, spreading everywhere from a centre, and forming a globe." Sent by the Rev. Mr. Davie from a lake in Anglesea. It covers the surface of the water in the months of July and August, and consists of innumerable minute globules of a glaucescent or verdigrasse green, all nearly of a size. When examined with a microscope each globule appears to be composed of a number of simple cylindrical short filaments apparently springing from a solid centre. Under a very high magnifier these filaments are found to be formed of short uniform joints, each of which is of an equal thickness throughout, but the upper ones gradually diminish in size. Mr. Davie Turner suggests that this minute vegetable ought probably to be referred to Roth's new genus rivalaria, to which Uva inerissa and U. pruniformis of English botany belong. These species are of a pulpy substance, clothed with jointed filaments.

**Not immersed.**


11. Compound.

* Not immersed.
† In full-water.

30. C. polymorpha. Linn. Sp. Pl. 17. Dilw. 44. L. marina geniculata nigra palma:; Dilw. p. 32. tab. 6. fig. 52. Ceramium futilatum. Roth Cat. Bot. ii. p. 173. "Filaments dichotomous, futilate, somewhat cartilaginous; joints short; capsules on the upper branchlets, egg-shaped, sessile." Filaments about the thickness of horse hair, repeatedly dichotomous, with rather acute angles, of a dark purple colour when young, afterwards becoming black. Common on the large flat rocks, mostly commonly on F. nodosus, in thick tufts, two or three inches long. 31. C. langiyo$. Dilw. 45. "Filaments nearly simple, very minute; of a dull colour; joints rather long, polygonal in the middle; capsules fultate, unilateral." In the sea, adhering to other conservae. 32. C. nigra. Hudf. Flor. Ang. p. 597. "Filaments equal, branched, very long; branches alternate, many-eleft, very short." Filaments five inches long, black, flaccid; branches faciculated. On the Yorkshire coast. 33. C. effusae. Dilw. 58. Eng. Bot. 547. "Filaments more than twice pinnated; branches and branchlets alternate; uppermost ones extremely short, somewhat faciculated; partitions from the union of the veins; joints rather long; capsules egg-shaped, sessile." Filaments extremely flaccid, zig-zag, transparent, beautifully iriated by longitudinal veins, each of which arch over at or near the same place, and appear to form the partition. Common on most of our shores, from three to five inches long, varying in colour from a reddish brown to a light or purplish brown. 34. C. parviflora. Hudf. Flor. Ang. p. 604. Eng. Bot. 1429. "Filaments branched; branches double and alternately pinnated; capsules axillary, solitary, oblong." Filaments an inch long or more, purplish-brown, slender, cylindrical, with the same jointed and tubular structure as the preceding. Parasite on fucce, found rarely on the coast of Yorkshire, Devonshire, and Cornwall. Dr. Smith observes that the last two species have the jointed structure of conferva, but agree better with the character of fucce in their fructification. The same observation will apply to several of the following species. 35. C. nigricens. Hudf. Fl. Ang. p. 602. Smith. Eng. Bot. 1717. "Filaments much branched; branches alternate, elongated; ultimate ones short, crowded, axil-shaped; joints rather broader than long, compound." Filaments from four to six inches long, blackish. Joints a little contracted, confiding of a circular double series of numerous parallel tubes, similar to those of C. hyfideae. Mr. Stackhouse is said to have found the fructification in small lateral nodules on the coast of Scotland, Devonshire, and Cornwall. 36. C. foetid. Hudf. 602. "Fila-
Confervae.

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more than an inch long, purple-brown, lying one over another, on the round pebbles in the sea. so as to have a flirking resemblance to an infant’s head. 51. C. tomentosa. Huds. Flor. Ang. 394. Dillw. 56. (C. marina tomentosa, minus tenera et ferrugineus. Dill. 19. tab. 3. fig. 15.) “Filaments much branched, very slender, thickly matted, divaricated, extreme branchlets simple; joints long.” Filaments from three to five inches long, of a pale greenish or rufescent-brown colour; branches fo slender as to be scarcely visible without a microscope, fluffing at right angles. Joints at least three times as long as thick. Partitions dark brown. Frequent, generally parasitical on fucus vesiculosus. 52. C. alpina. Huds. Flor. Ang. 395. (C. marina tomentosa, teneror et albicans. Dill. 19. tab. 3. fig. 12.) “Filaments much branched, very slender, equal; branchlets simple, fasciculated, white.” Filaments scarcely separately visible to the naked eye, pale green, soft, reftilling remake. Found in falt water, ditches, and pools in the island of Selsey in Sussex. 53. C. fetacea. Huds. Flor. Ang. 595. Smith Eng. Bot. 1689. Dillw. 81. (C. m. gelatinosa corallina inear genculata, teniior. Dill. 32. tab. 6. fig. 37.) “Filaments alternately and repeatedly branched, taper-pointed, fasciculated, fferphiy; joints a little dwelling, at least four times as long as broad; lateral shoots bearing tufts of filaments containing many gloomular seeds. Seldom exceeding four or five inches in length, of a rich crimson colour. On rocks and fones in the sea, not unfrequent at the latter end of summer and beginning of autumn. 54. C. borrici. Smith Eng. Bot. 1741. “Filaments capillary, repeatedly branched; branches alternate, spreading in two directions, zig-zag; ultimate ones falkipate; joints cylindrical, about twice as long as broad.” Filaments in tufts, about two inches long, of a delicate pink colour, turning orange when dry. Fertificaticn unknown, but conjectured by Dr. Smith to refeemble that of C. fetacea. Gathered on Yarmouth beach by W. Borric, esq. F. R. S. 55. C. spinca. Dillw. 40. “Filaments somewhat dichotomous, fasciculated, veined; joints long.” Filaments in thick bundles, many from the same rock. C. fesca. Huds. Flor. Ang. 596. Smith Eng. Bot. 1089. Dillw. 82. (C. m. gelatinosa corallina inear genculata, teniior. Dill. 32. tab. 6. fig. 37.) “Filaments alternately and repeatedly branched, taper-pointed, ffaciculated, fferphiy; joints a little dwelling, at least four times as long as broad. On rocks in the sea, at Dover and Swanage. 56. C. rothii. Turton’s Syst. Nat. 6. 1866. Dillw. 73. Eng. Bot. 1792. (C. violacea. Roth. Cat. Bot. 1. 190. tab. 4. fig. 1.) “Filaments erect, dichotomous, short, densely tufted, crimson; branches alternate; joints very short.” Filaments very fnder, from three to twelve lines long. Joints cylindrical, about twice as long as broad. On rocks by the sea-flore. 57. C. corallina. Linn. Sp. Pl. 15. (C. marina gelatinosa corallina inear genculata caflerif. Dill. 32. tab. 6. fig. 36.) “Filaments dichotomous; joints thicker at the top.” Filaments bright red or white, sliferiy, very tender, almost disappearing when dry. On fones on the sea-flore. 58. C. tubulosa. Huds. Flor. Ang. 600. (C. marina fihuloa. Dill. 34. tab. 6. fig. 30.) Ulva confervoides. Linn.) “Filaments much branched; joints oval, alternately compressed.” Filaments from two to four inches long, yellowish green; branches knotted, hollow. On rocks, fones, and fuci. 59. C. ctenata. Linn. Sp. Pl. 16. Lam. 16. (C. ramosa, genicus longioribus cateniformibus. Dill. 27. tab. 5. fig. 27.) “Filaments branchet, green; joints oblong, forming a kind of chain, with links alternately broader and narrower.” On the coasts of Carolina, the Bahama islands, and the south of Europe. 60. C. floparia. Linn. Sp. Pl. 9. Lam. 9. Smith Eng. Bot. 1572. Dillw. 52. (C. marina penata. Dill. 24. tab. 4. fig. 23.) “Filaments much branched, rigid; branches fasciculated, ultimate divi- sions alternate, acuminate; partitions obtuse; joints short.” Whole plant of a brownish olive, elongating when dry to a rufescent-brown colour. Filaments from two to six or nine inches long; upper branches longer and more clustered than the lower, giving the plant a bruih-like appearance. Joints about as long as thick. Frequent on the sea coast on fones and pebbles. 61. C. penata. Huds. Flor. Ang. 624.—Dillw. 85. “Filaments branched; upper branches pinnate; pinnae nearly opposite, nearly horizontal, approximate, fluff and ftraight; partitions obtuse; joints short; tubercules flile, spherical.” Often confounded by botanists with the preceding. Filaments in fluffy tufts from half an inch to two inches long, olive green, brown when dry. On rocks, fuci, & corallines. 62. C. verrucosa. Smith Eng. Bot. 1688. “Branches irregularly flattered and subdivided, scarcely jointed, fluffed with rough warts.” Filaments three or four inches long, pale reddish brown, capillary, but uneven, somewhat twisted, not perceptibly jointed, except in the youngest shoots, where an interruption of colour is sometimes perceived at intervals. Found on the coast of Hampshire and Cornwall. 63. C. infacea. Huds. Flor. Ang. 603.—Smith Eng. Flor. 546.—Dillw. 37. “Filaments branched; branches and branchlets opposite, diffuse; joints very short: partitions obtuse, villosus.” Stem from six inches to three feet high, greenish yellow, seldorn more than thrice divided; hairs in whorls on about every fourth or fifth joint, extremely flender, brittle; partitions not readily discooverable except in the verticillated hairs. On sub-marine rocks and fones. 64. C. ciliata. Ellis in Philos. Trans. vol 57. p. 425. tab. 18. f. 4. H.—Dillw. 53. (C. piocia; Roth Cat. Bot. 2. 245. tab. 5. fig. 2.) “Filaments dichotomous, incurved at the tips in a forceps-like manner; partitions biflet with verticillated ciliate, reddish at each end, pellicul in the middle; capsules somewhat glo- bular, lateral.” Filaments in fluffy tufts, seldom more than two inches long, varying from a bright to a purplish red. On rocks, fones, and fuci, frequent. 65. C. equilirifolia. Ligh. Flor. Scot. 964.—Smith Eng. Bot. 1479.— Dillw. 54. (C. imbricata; Huds. Flor. Ang. 603, and multifida. Huds. 663, as appears from an authentic speci- men communicated by Mr. Goodenough to Mr. D. Turner.) “Filaments much branched; branches acini- mated, elongated; branchlets verticillated, dichotomous; joints of the branchlets long.” From three to eight inches long, the thickness of a crow’s quill, bright red when young, afterwards dull brown. Stem and branches everywhere cloathed with numerous whorled branchlets, which, being longer than the joints, are tilled upon each other, and give the plant a rough spiny ap- pearance. On rocks and fones in the sea, not unfrequent. 66. C. lapa. Huds. 596.—Dillw. 42. (Fucus hirintus; Linn. Mutt. 134.—Mucilus marinus hirintus; Morifi. 3. 650. tab. 9. fig. 6.) “Filaments branched, branchlets very short, cimple, imbricated on all sides; joints short; capsules oblong, pedicelled.” Seldom more than three inches long, olive-coloured. Branchlets not whorled but dif- posed without any regular order, not dichotomous. Capsules small, on rather long pedicel, discharging the seeds at the summit. Rocks in the sea, not uncommon. 67. C. ver- ticillata. Ligh. Flor. Scot. p. 964.—Smith Eng. Bot. 1718.—Dillw. 55. (C. Miynorthymum; Roth in Schrader’s Journ. 5. 535.) “Filaments cartilaginous, variously bran- ched; branchlets at the partitions, verticillated, very short, incurved, frequently forked; joints about as broad as long.” Four or five inches long, of a dull olive colour. On rocks and fones in the sea. 68. C. arbycula. “Primary filaments thick, not jointed, naked near the bottom, much branched above; branchlets crowded, somewhat verticilli-
lateral, short, branched, jointed; joints cylindrical, short." About three or four inches long, of a beautiful deep-red brown colour when fresh, dull brown when dry without glos. On submersed calcareous rocks in the north of Ireland. 69. C. concilia. Linn. Sp. Pl. 10. Lam. 10. —Huds. Flor. Ang. p. 596.—Dill. 24. tab. 4. fig. 27. "Filaments branched and in water.; those short, much divided, digitate." Three or four inches long, of a pale dirty colour, irregularly branched; branches an inch and half or two inches long; branches capillary, numerous, incurved, leaving a hollow space between them and the branch. On stones and rocks in the sea. 70. c. reniform. Dillw. 18. Smith Eng. Bot. 1628. (C. fulva; Huds.7) "Filaments minute, creeping, densely matted; partitions scarcely contracred; joints cylindrical, twice as long as they are broad." Seldom more than three or four lines long, the thicknesses of human hair, or of a more or less vivid red colour, inveting the larger fuic and conferee in minute denfe tufts like velvet or plush; branches and branchlets generally unilateral. 71. C. fuscina. Dillw. 10. "Filaments dichotomous, rather rigid; branches zigzag; branchlets generally simple, very slender, alternately unifal, spreading; joints cylindrical; partitions obfolute." Filaments in closely entangled maffles, from four to eight inches long, finer than human hair, pale yellowish green in the branchlets, very dark green in the main shoots. In the sea coast and in salt-water pools at Yarmouth. 72. C. Leti virgata. Dillw. 48. "Filaments much branched, rather rigid, curved; branches twice alternately unilateral; partitions pelliculae; joints long." Filaments from three to six inches long, light green, irregularly branched, growing in a buily manner. On rocks, fucis, and corallines on the Welsh coast. 73. C. diffusa. Dillw. 21. Roth Cat. Bot. 2. 207. tab. 7. "Filaments branched, diffusè; branches somewhat dichotomous, zig-zag, remote; branchlets short, approximate, obtuse; partitions pelliculæ; joints rather long." Filaments in loosely entangled bundles, from two to fix inches long, pale green, more rigid than in most other species, not collapsing when drawn out of the water. On rocks in the sea. 74. C. rotundif. Linn. Sp. Pl. 20. Lam. 20. Dillw. 23. Smith Eng. Bot. 1629. (C. glauca; Roth Cat. Bot. 2. 228. tab. 6. C. trichodes ramiforius. Dill. 28. tab. 5. fig. 29.) "Filaments much branched, faciculated, rigid, straught, obtuse; joints long, even; partitions but little contracred, colourless." From three to fix inches long, dull green, in denfe tufts upon rocks, pebbles, or dead shells. 75. C. pellicula. Huds. p. 9. Smith Eng. Bot. 1718. "Filaments erect, much branched; branches mostly ternate, cylindrical; joints even, cylindrical, four times as long as broad." Filaments about six inches long, green, shining, pelliculæ, somewhat wiry and elastic to the touch, naked and flaxen-like towards the bottom. On the coasts about Yarmouth. 76. C. faniculata. Huds. p. 594. Dillw. 16. tab. 2. fig. 8. "Filaments sparse, much branched; branches and branchlets very long, scattered," Filaments irregularly divided like the leaves of fennel, soft and greenish when young, brownish and fluffier when old. On the shores of Cornwall and the Isle of Man. 77. C. spiculifera. Linn. Sp. Pl. 7. Lam. 7. (C. marina capillacea brevis, viridifima mollis; Dill. 23. tab. 4. fig. 20.) "Filaments branched, soft, shorter than the human finger, very green." Filaments numerous, very fine, shining and silvery when dry, retaining their elegant cerulean green colour. On fucis, not very common. 78. C. vagabunda. Linn. Sp. Pl. 18. Lam. 18. (C. marina trichodes, late in ter expansa; Dill. 30. tab. 5. fig. 32.) "Filaments zig zag, much branched; branch-
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pound, twisted; partitions contracted; joints short." Various in length from half an inch to three inches, and from a slight to a dark green. Main stems remarkably pale and slender; branches darker, joints short. In pools and ditches, not uncommon. 86. C. atræ. Hudf. p. 597. Smith Eng. Bot. 68. Dillw. 11. (C. juncta, nodosa, lirubica, filamentos usina; Dill. 37. tab. 7. fig. 46.) "Filaments much branched, beaded, somewhat gelatinous; branchlets br. thickened; joints dilated towards the tip, dilated; edge punctilious, umbilicated." Varying in colour, during different stages of its growth, from a pale to a dark green, and finally becoming black. In clear rivulets and springs. 87. C. turkofolafa. Roth Cat. Bot. 21. 222.) "Filaments branched, rather rigid; branches and branchlets generally alternate, attenuated each way; partitions subequale, tubercled; joints long, dilated at both ends." Filaments fixed or eight inches long, dull olive or greenish purple; sometimes nearly simple, when they are shorter, thicker, and more rigid. Dill. 48. Dillwyn has seen these different filaments growing from one root. In rapid, rocky streams. 88. C. lirubica. Dillw. 37. "Filaments much branched, slender, very long, shining, filfy; branches thin-like, joints rather short." Filaments from six inches near to a foot long, green, with a flight tinge of blue, branches scattered, forming an acute angle with the stem. In clear rivulets attached to stones and wood in large gelatinous masses. 89. C. pro- tophi. Dillw. 67. "Filaments much branched; branches dilute, much lengthened out, pelliculat at the tip; joints rather long." Filaments from two lines to a half or three quarters of an inch long, light green. In rivulets and springs, on stones and aquatic plants. 90. C. glomerata. Linn. Sp. Pl. 19. Lam. 19. Flor. Dan. tab. 631. fig. 2. Dillw. 15. (C. fontinalis ramifilis glomerata convoluta. Dill. 28. tab. 5. fig. 31. critata; Roth Cat. Bot. 3. p. 153. 2. p. 220.) "Filaments much branched; branches alternate; branchlets unilateral, fasciculated, pencil-form; partitions pelliculat; joints cymodial, rather long." Filaments from two or three inches to a foot long, yellowish green. On stones and wood in clear rivers and streams. 91. C. rigida. Hudf. Flor. Ang 594. (C. flavatulus frîbil- flosa frigida; Dill. 21. tab. 4. fig. 17.) "Filaments much branched; branches alternate; partitions pelliculat; joints cymodial, rather short." Filaments varying from the same base, so as to have a clustered appearance, and sometimes to cover the pebbles to which they are attached, dull green, often inclining to brown. Somewhat hairy; branchlets most numerous near the summit of the filaments. In clear streams. 92. C. canalicula- ria. Linn. Sp. Pl. 4. Lam. 4. (C. raviolus epispicae den- filinum convolutus ramulis; Dill. 17. tab. 4. fig. 15.) "Filaments most branched near the base; branches long." Filaments one or two inches long, flender, deep green, filmy or but little branched above the middle, of a spongy soft substance, densely mixed together so as to resemble a piece of velvet, soft and herbaceous when fresh, but when dry blackish, and acquiring almost a flaky hardness from the mud adhering to it. In pure streams and mill-pond water spouts. 93. C. bulbifora. Linn. Sp. Pl. 3 Lam. 3. (C. palustris bom- bivcna; Dill. 18. tab. 3. fig. 11.) "Filaments branched, made including air bubbles." Filaments from three to six inches or a foot long, flender, dus yellowish green. In clear waters, soft, somewhat pinky, and of a lovely green; in stagnant muddy waters, paler, tammous, resembling dirty cotton. Professor Mitten is of opinion that C. fratica is the plant incided by Linnæus, and hence called C. bu- lifornia; but Mr. Dillwyn observes that the specimen in Dill- wyn's herbarium, here described, is certainly another species, and agrees with Mr. D. Turner in thinking, that several distinct plants which have the property of returning bubbles of air have been confounded by authors, and consequently that the confervæ bulbifora are a family and not a species. The confervæ when dried have been used as wadding for stuffing garments, and have been woven into coarse household linen. 94. C. elongata. Flor. Dan. tab. 520. Dillw. "Filaments branched, jointed, fasciculated with transverse lines; branches and branchlets dilute; partitions oblong; joints thin and clear, thickened at first inch long, extremely slender, of a beautiful dark green col- or varrying to a lighter colour as they approach to decay; branches seldom numerous, but with a very peculiar twist at their ramifications. Parastal in short thick tufts on decaying grass, attached to small pieces of which it frequently floats on the surface of the water. Hitherto found in Great Brit- ain, only by Mr. Dillwyn, in a hoggy pool on Sketty Bur- roughs, near Swansea. 95. C. aggrapina. Linn. Sp. Pl. 21. Lam. 21. Smith Eng. Bot. 1577. Dillw. 87. "Filaments much branched, cluttered into a globe and divaricat- ing from the centre; branches and branchlets nearly unila- teral, straight, obtuse; joints long, cylindrical." From the size of a pea to three or four inches in diameter, always pretty exactly spherical, hollow within, without any solid body, or root, to which the filaments might originally have been attached. The specific name alludes to the hairy balls found in the bosom of goats. In lakes lying in great abundance at the bottom of the water. 96. C. nana. Dillw. 50. "Filaments branched, very minute; branches and branchlets generally alternate, acuminate; partitions pelliculat; joints cylindrical." Filaments seldom much more than half a line long, of a pale brown colour tinged with brown, resembling C. littarum in its ramifications, and remarkably acuminate branches. Parastal on decayed confervas, &c. in rocky rivers. 97. C. tephaloderma. Dillw. 83. "Filaments nearly simple, densely matted; partitions obscure; joints short." The extreme tenuity and entangled growth of the filaments makes it impossible to ascertain their length; their colour is a dull olive green. Observed in a bottle which contained a solution of gum dragon in water, the surface of which was covered with a mass of filaments so densely interwoven as to form a film about two lines in thickness, bearing a considera- ble resemblance to the skin of a mole. 98. C. ochracea. Dillw. 62. Roth Cat. Bot. 1. 65. tab. 5. fig. 2. "Filaments much branched, very flender, very brittle, clothe compact, constituting an ochraceous jelly, which at length breaks into fragments of separate filaments. The filaments are so extremely fragile that the slightest touch of any con- siderable agitation of the water breaks them into a thou- sand pieces, which at first remain suspended, and afterwards sink to the bottom in the form of an ochraceous powder. In this state only can the plant be examined, but the fragments are so small that it is impossible to ascertain their original length, and under the highest magnifiers their thickness scarcely seems equal to that of the human hair. In pools and ditches common, of a dull yellow colour. 99. C. latia. Dillw. 79. Roth Cat. Bot. 1. p. 216. 3. p. 292. (C. pu- filla; Roth Flor. Germ. 1. 524.) "Filaments much branch- ed, gelatinous, filfy; branches rod-like, alternate from each partition; partitions contracted; joints very long, glazy-transparent." Filaments growing in gelatinous masses at the bottom of ditches and rivulets, from half an inch to three or four inches long, of a dirty white colour; branches clustered, so as to give them a brush-like appearance; parti- tions of a dusky colour. Joints at least ten times longer than
then thick. 100. C. myceliodes. Dillw. 17. Smith Eng. Bot. 1552. "Filaments very densely matted, branched; branchlets simple, generally unilateral, in pairs, incursed." Filaments sometimes quite simple, generally branched, seldom more than half an inch long, as fine as the finest wool. On the rocky beds of torrents in the vale of Bedegerec, in Caernarvonshire, matted the stones with a velvet covering, three or four lines in diameter, of a dark glossy brown colour, soft to the touch, which, when taken out of the water, might be compared to the skin of a mouse. 101. C. vesicata. Dillw. 74. Muller in Nov. Act. Pet. 3. "Filaments branched, somewhat jointed, rigid; vehicles innate, solitary, elliptical, broader than the filament; capsules generally in pairs, pear-shaped on short peduncles." Filaments in bulky masses at the bottom of the water, so extremely brittle that their length cannot easily be ascertained, yellowish green, cylindrical, filled with minute granules which issue from them when broken; very tough to the touch; branches few, dilated, generally making an obtuse angle with the stem. Stems of the branches frequently swollen, with bladder-like vehicles, four or five times thicker than the filaments, resembling those of fucus nodosus. Partitions irregularly disposed, always at a great distance from each other. 102. C. amphibia. Linn. Sp. Pl. 5. Lam. 5. Dillw. 41. (C. amphibia frillifera et piongiodes; Dill. 22. tab. 4. fig. 7. B and C.) "Filaments somewhat jointed, branched, densely matted; branches spreading, remote; branchlets, when not immersed, collecting into sharp brilhly points; partitions but little contracted; capsules fuscous, somewhat elliptical." β. branches elongated (C. fuscata; β. Hudf. Ceramium coerpi tofum; Roth Cat. Bot. 1. p. 154. 2. p. 156. C. palustris filaments brevioribus et crenulosis; Dillw. 17. tab. 3. fig. 10.) Filaments very various in length, according to the situation, bright green, becoming ash-coloured with age; a is the plant as it grows on the edges of ditches, and in shallow water, where it is not wholly immersed. In such situations, it frequently occurs in masses, so densely matted as to hold water like a sponge, with its surface breath, which give it a bulky appearance. In floods, when the waters subside, the length of the filaments is gradually increased, and forms Mr. Dillwyn’s β; but when the waters subside, the filaments, again exposed to air, take of course an horizontal direction, and again throw out erect spreading branchlets, which, on being dried, collapse so as to form rather stiff points. In rivers, the branches are frequently carried out by the force of the stream to a great length, and in that case do not assume a brilhly appearance when exposed to air; probably owing to the less spongy nature of the mafs, in consequence of which the water is not so readily transmitted to the upper surface, as to enable it to make fresh shoots. The plant has a mouldy ungrateful smell, and is much used as a shelter by aquatic insects.

* * * Not immersed.

103. C. atro-virens. Dillw. 25. "Filaments rather rigid, branched; branches divericated, somewhat unilateral, attenuated at both ends, rather obtuse; partitions peduncled; joints very short, marked with three points." Filaments from a quarter to half an inch long, growing in thick bulky tufts, of a blackish green colour, not uninteresting interspersed with moss. On the wet rocks, forming the banks of the river Dylais, near Neath. 104. C. frigida. "Filaments not jointed, creeping, branched; Dillw. 16. (Ceramium Dillwynii; Roth.) "Filaments not jointed, creeping, branched; branches alternate; capsules fuscous, yellowish, bullet-shaped, often with a stiff tuft, six to ten inches in length, growing into the naked eye like brick-dust. Parasitical on crustaceous rocks.
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Filaments to some extent, which are already described by that great cryptogamist, omitting such as he was not able to identify, and considering some as mere varieties. La Marcht, in Encyclopédie Methodique, has done nothing more than copy the Linnaean species, in exactly the same order, 

Hudfon, in the second edition of his "Flora Anglica," has introduced several species, not known either to Dillenius or Linnaeus. Lightfoot, in his "Flora Scotia," has also made one or two additions. But it is not more than six or seven years since rapid advances have begun to be made in the knowledge of Confera. Mr. D. Turner and Mr. Dilwyn are now diligently employed in the investigation of the British species; several foreign botanists, professor Roth in particular, are successfully engaged in the same pursuit; and we are informed by Bofc, in "Nouveaux Dictionnaire d'Histoire Naturelle," that professor Draparnaud of Montpellier is now busy in preparing a Monographia Confervarum, and has already determined several hundred species. We have been induced to confine ourselves, with a single exception, to the British species; partly by our inability to procure all the works which are necessary for a complete account of what has hitherto been done by foreign botanists; but chiefly by the consideration, that the species which belong to the Flora of the British islands, are the only ones accessible to the greater part of our readers. Our knowledge of these plants is indeed still very imperfect, and no generic character has yet been formed, which is sufficiently discriminating and comprehensive. The jointed structure of the filaments has generally been considered as an essential character; but we have been led by the high authority of Mr. Dilwyn to admit one species (n. 104.) which has not this conformation. We have already seen that the fructification of several species does not consist of "elided tubercles," as is described even in Dr. Smith's last improved generic character, but of "capitates" opening at the apex, and discharging the seeds in a manner similar to that observed in many fungi. These have been separated by Dr. Roth into a distinct genus which he calls ceramium; and it is probable that further researches will prove the propriety of making other separations. M. Vauquelin of Geneva thinks, that he has discovered five different modes of propagation in the plants usually called conserver; which has induced Decandolle to form them into six genera. Consera. Filaments carthagineous or herbaceous, divided by partitions; seeds enclosed between the partitions, and not escaping but by the destruction of the tube itself. Ceramium. Filaments membranous, cartilagineous, without partitions; capsules monoporous, adhering to the external surface of the filaments. Vaucleria. Filaments herbaceous, simple or branch- ed, without partitions; seeds attached to the exterior side of the filaments, and generally pedunculated. Botrychium. Filaments knotty, jointed, gelatinous; knots formed of filaments, simple or compound, between which are found feeds or hoots (cavex) detaching themselves, and confining of filaments already jointed. Chantras. Filaments solid, knotty; knots separating and becoming new plants, in the way of flaps or cuttings. Hydrocladium. Tube cylindrical, closed at the two extremities, and anastomosing into pentagonal meshes; filaments of the pentagon feeding at their extremities, separating and becoming themselves cylindrical tubes, closed at the ends, and composed of pentagon meshes. The last three genera, according to his ideas, have no proper feeds.

See some curious experiments by Dr. Prieišley on a species of conserver or water-moss of a peculiar kind, the manner of its production, and its effect, by the concursing action of light upon it, in dephlogismating or depraving the air to which it has access, and thereby increasing the quantity of it; in "Observations on Air," vol. iv. p. 335. & c. vol. v. 2, 3, 4, 5. The feeds of this plant, says Dr. Prieišley, float every where; in the air, on the earth, on the sea, in the Alps, in the plains, under the poles and the equator, in summer and winter, and in all seasons; and they are received into the water, insinuating themselves into vessels of water through the smallest apertures, where they germinate. Dr. Ingeniheiz made a variety of experiments on this singular substance; from which he concludes, that the water itself, or some substance in the water, is converted into this kind of vegetation. It is a real transmutation, which may appear incomprehensible to the philosophical mind, but which, in reality, is not more extraordinary than the change of the earth and other vegetables into gramine in the bodies of granivorous animals, and the change of the aqueous juice of the olive into oil. Dr. Prieišley, however, observes, that the change of water into an organized plant is a thing of a very different nature from thefe, and tends to revive the long exploded doctrine of equivocal or spontaneous generation. Dr. Girtanner of Gottingen (see Annales de Chemie, No. 102.) traces its formation from azot, which is a confluent principle of bodies, in the following manner. When water is exposed to the sun the light decomposes it, and diffuses the oxygen in a large quantity. The hydrogen then retains the tail portions of the oxygen; azot is formed, and announces itself by its green colour; the water is more decomposed; more of the oxygen, which, in the opinion of this writer, is the principle of life and irritability in organized nature, becomes fixed; and this azot, produced from water by means of the sun, is an organized body, the "consera forinalis;" a plant which lives, expands, and perpetuates its species. The influence of the solar light is, he conceives, absolutely necessary for this conversion of water into a plant or organized azot. No degree of heat can supply its place. Mr. Senger of Reik, in Wellphalia, has lately discovered, that the conserver affords next to sage, one of the fittest materials for the making of paper; in conformance of which he obtained the honour of a gratuity from the court of Berlin, and also a patent for the manufacture of paper from this substance. From his experiments it likewife appears, that the conserver, after a previous preparation, might be made a sublimate for cotton-wool, and a succedaneum for feathers in beds.
CONFESS and avoid, in Law, a species of replication, in which the plaintiff introduces some new matter or disclaimer, consistent with his former declaration; as, in an action of trots upon lands of which the defendant is seised; if the defendant pleads a title to the land by descent, the plaintiff may either deny the fact, or confess and avoid it, by replying, that such defect happened, but that the defendant hath since demised the lands to the plaintiff for the term of life. Blackl. Com. vol. iii. p. 310.

CONFESSTo and, in Retort, the same with what is otherwise called paronomology.

Confession, in a Civil Suit, a declaration or acknowledgment of some truth, though it be against the interest of the party who makes it, whether it be in a court of justice, or out of it. It is a maxim, that in civil matters, the confession is never to be divided, but always taken entire; and that a criminal is never condemned on his simple confession, without other collateral proofs; nor is a voluntary extra-judicial confession admitted as any proof. A person is not admitted to accuse himself, according to that rule in law, non auditer peruere volens.

Confession of Action, in Law, is a species of plea to the action, in which the merits of the complaint are answered, by confessing either wholly, or, which is most common, in part. A confession of the whole complaint is not very usual, for then the defendant would probably end the matter sooner; or not plead at all, but suffer judgment to go by default. Yet sometimes, after tender and refusals of a debt, if the creditor harasses his debtor with an action, it then becomes necessary for the defendant to acknowledge the debt, and plead the tender; adding that he has always been ready, "tou temps prit," and will is ready, "uncore prit" to discharge it: for a tender by the debtor, and refusals by the creditor, will, in all cases, discharge the debts. (1 Vent. 21.) but not the debt itself; though in some particular cases the creditor will totally lose his money. (Litt. § 338. Co. Litt. 200.) But frequently the defendant confesses one part of the complaint (by a "cognizit actionem" in respect of it,) and traverses or denies the rest; in order to avoid the expense of carrying that part to a formal trial, which he has no ground to litigate. A species of this sort of confession is "the payment of money into court;" which is for the most part necessary upon pleading a tender, and is itself a kind of tender to the plaintiff; by paying into the hands of the proper officer of the court as much as the defendant acknowledges to be due, together with the costs hitherto incurred, in order to prevent the expense of any farther proceedings. This may be done upon what is called a "motion," which is an occasional application to the court by their parties or their counsel, in order to obtain some rule or order of court, which becomes necessary in the progress of a cause; and it is usually grounded upon an "affidavit" (the perfect tense of the verb "aflido") being a voluntary oath before some judge or officer of the court, to evince the truth of certain facts, upon which the motion is grounded; though no such affidavit is necessary for payment of money into court. If, after the money paid in, the plaintiff proceeds in his suit, it is at his own peril; for, if he does not prove more due than is paid into court, he shall be non-suited and pay the defendant's costs; but he shall still have the money paid in, for that the defendant has acknowledged his due. Blackl. Com. vol. iii.

Confession of Indictment, is a prisoner's acknowledgment of the offence, when he is brought to the bar to be arraigned; upon a simple and plain confession, which the court is backward in receiving and recording, nothing re-
more partial and restricted fences, it is a declaration of a person’s sins, made to a priest, in order to obtain absolution for the same. The Roman church makes confession a part of the sacrament of penance.

Confession was anciently public and general, in the face of the church; though the Romanists have since altered it, and made it private and auricular.

Confessions are to be buried in eternal silence, under pain of the greatest punishment to the priest who reveals them. Bellarmine, Valentin, and some other Roman controversial writers, endeavor to trace up auricular confession to the earliest ages; and thus contend for a point given up by the ref. M. Fleury owns, that the first instance of auricular confession he can meet with, is that of St. Eloi, who, being grown old, made a confession to a priest of all his sins from his youth upwards.

Secret confession was first decreed and established in the 4th council of Lateran, under Innocent III., in 1215, cap. 21. And the decree of this council was afterwards confirmed and enlarged in the council of Florence, and in that of Trent (fess. 14. cap. 5.), which expressly ordains, that confession was instituted by Christ, and that by the law of God it is necessary to salvation; and that it has been always practised in the Catholic church. Hard. Concil. tom. vii. p. 35. and tom. x. p. 92. See Povera.

The Indians, according to Tavernier, have a kind of confession; and the same may be said of the Jews: they have, of late, have formulas for those who are not capable of detail all of their sins: the ordinary form is in alphabetical order, each letter containing a capital sin. They usually rehearse on Mondays and Thursdays, and on fast-days, and other occasions; some every night and morning. When any of them find themselves near death, they find for ten persons, more or less, one of them a rabbinc; and in their presence recite the confession. See Leo de Modena.

Confession of faith, denotes a list, or enumeration and declaration of the several articles of belief, in a church. See Articles of faith.

In the council of Rimini, the Catholic bishops found fault with dates in a confession of faith, and observed that the church never used to date them.

Confession, Augsburg or Augsflam. See Augustan Confession.

Confessional, or Confessionary, in Church History, a place in churches, usually under the main altar, wherein were deposited the bodies of deceased saints, martyrs, and confessors.

Confessional is also used in the Roman church for a little box or desk in the church, where the confessor takes the confessions of the penitent.

Confesso, Pro-Confesso. See Pro-Confesso.

Confessor, Pro-Confessor. See Pro-Confessor.

Confessor, a Christian, who has made a solemn and redoubled profession of the faith, and has endured torments for its defense. A mere fiant is called a confessor, to distinguish him from the roll of dignified saints; such as apoiiets, martyrs, &c.

The time of confessors was given in the early ages of the church, and particularly towards the commencement of the first century of the Christian era, to those who, in the face of death, and at the expence of honour, fortune, and all the other advantages of the world, had confided with constance, before the Roman tribunals, their firm attachment to the religion of Jesus.

In ecclesiastical history we frequently find the word confessors used for martyrs; in after-times, it was confined to those who, after having been tormented by the tyrants, were permitted to live and die in peace. And at last it was also used for those who, after having lived a good life, died under an opinion of necessity. According to St. Cyprian, he who preferred himself to torture, or even to martyrdom, without being called to it, was not called a confessor, but a professore: and if any out of a want of courage abandoned his country, and became a voluntary exile for the sake of the faith, he was called estra." The veneration that was paid to both martyrs and confessors in the early ages of the Christian church is hardly credible. The distinguishing honours and privileges they enjoyed, the authority with which their councils and decisions were attended, was such as never had any model for an interesting history. Without doubt it was both wise and just to treat with respect, and to invest with extraordinary privileges, those Christian heroes, since nothing was more adopted to encourage others to suffer with cheerfulness in the cause of Christ. Nevertheless, as the bell and wire institutions were generally permitted by the weakens or corruption of men, from their original purpose; so the authority and privileges granted, in the beginning, to martyrs and confessors, became, in process of time, a support to superstition, an incentive to enthusiasm, and a source of innumerable evils and abuses. See Martyr.

Confessor is also a priest, in the Roman church, who has power to hear sinners in the sacrament of penance, and to give them absolution. See Shiray-car

The church calls him in Latin confessor, to distinguish him from confessor, which is a name consecrated to saints. The confessors of the kings of France, from the time of Henry IV. have been constantly called: before him the Dominicans and Cordeliers shared the office between them. The confessors of the house of Austria have also, ordinarily, been Dominicans and Cordeliers; but the latter emperors have all taken Jesuits.

Confessor to his Majesty. See Clerk of the Closet.

Confidence, in the English Language, denotes a firm reliance on the skill, courage, conduct, &c. of an individual. It is of the first importance for the commander of an army to have the entire confidence of the officers and soldiers under his command. This was remarkably the case with Hannibal, Julius Caesar, &c. among the ancients, and with the marshal de Turenne, John duke of Marlborough, &c. among the moderns. A general, in whom his troops have confidence, may gain a victory without employing much military skill; and on the other hand, the most skilful general may lose one, who has lost the confidence of his army.

Configuration, the exterior surface, that bounds bodies, and gives them their particular figure.

That which makes the specific difference between bodies, is the different configuration, and the different situation of their parts. A short, or a long fight, depend on the different configuration of the crystalline.

Configuration of the planets, in Astronomy and Astrology, is a certain distance or situation of the planets in the Zodiac, whereby they are supposed to aid, or oppose each other. See Aspect and Satellites.

Configurations of falls, a term used by some to express the combinations of the particles of the falls of plants, and other substances, into certain figures, on evaporating the water in which they had been dissolved, so hastily as not to admit of their forming into their own regular crystals. See Crystalization.

Confession to the realm. See No exact vagrum.

Confirmation, in a general sense, the act of ratifying or rendering a title, claim, pretention, report, or the like, more sure and indisputable. See Confirmation.
CONFIRMATION.

Confirmation, in Law, denotes the conveyance of an estate, or right in estate, which a person hath in or to lands, &c. from one man to another that hath the possession or some estate in it, whereby a voidable estate is made sure and unavoidable, or a particular estate is increased, or possession made perfect; and it is particularly used for the strengthening or homologating an estate of one already in possession of it by a voidable title. Thus, if a bishop grant his chancellorship by patent, for term of the patent's life; this is no void grant: yet it is avoidable by the bishop's death, except it be strengthened also by the confirmation of the dean and chapter. (1 Litt. 295.)

Confirmation is also defined to be the approbation or assent to an estate already created: so far as it is in the power or consent of the confirmer, makes it good and valid; so that the confirmation doth not regularly create an estate, yet such words may be blended in the confirmation as may create and enlarge an estate; but this takes place by the force of such words as are foreign to the business of confirmation, and by their own force and power, tend to create the estate. Gibb. Ten. 75. A confirmation, says judge Blackstone, is of a nature nearly allied to a release; and the words of making it are these "have given, granted, ratified, approved, and confirm'd." (Litt. § 516.) An instance of the first branch of the above definition is, if tenant for life leave the for 40 years, and die hath during that time; here the lease for years is voidable by him in reversion; yet, if he hath confirmed the lease of the lifetime for years, before the death of the tenant for life, it is no longer voidable but sure. (Litt. § 516.) The latter branch, or that which tends to the increase of a particular estate, is the same in all respects with that species of release, which operates by way of enlargement.

Madox says, that most ancient confirmations, made after the conquest, often ran like feoffments; and are distinguishable from them chiefly by time words indicating a former feoffment, or grant. In former times, when feoffages were frequently divided of their lands upon some testament or other, charters of confirmation seem to have been in great request. Possessions of lands, &c. seem'd not to have thought themselves secure against the king, or the great lords who were their feoffors, or in whose lands their fees lay, unless they had repeated confirmations from them, their heirs or successors. And these ancient confirmations seem to have been sometimes made, either by precept or writ from the king, or other lords, to put the feoffees, or their heirs or successors into feoff, after they had been divided, or to keep them in their feoff undiverted, or eile by charter of express confirmation. Confirmation is "perficient, crecent, or diminutum" perfect, as if feoffee upon condition make a feoffment, and the seoffor confirm the estate of the second seoffee;—crecent, which always enlarges the estate of a tenant;—as tenant for years to hold for life, &c.:—and diminutum, as when the lord of whom the land is helden, confirms the estate of his tenant, to hold by a lease rent. 5 Rep. 142.

The lord may diminish the services of his tenant by confirmation; but not referve new services, so long as the former estate in the tenancy continues; and therefore if he confirm to the tenant, to yield him a hawk, &c. yearly, it is void. (Litt. § 519. 1 Co. Litt. 296.) Leases for years may be confirmed for part of the term, or for part of the land, &c.; but an estate of freehold, being entire, cannot be confirmed for part of the estate. (5 Rep. 51.) There may be a confirmation implied by law, as well as express by deed; where the law by construction confirms a grant made to another purpose: and a confirmation may enlarge an estate, from an estate held at will to term of years, or a greater estate, from an estate for years to an estate for life; from an estate for life, to an estate in tail, or in fee; and from an estate in tail to an estate in fee-simple. (1 Litt. 355. 9 Rep. 142. Dyer. 263.) But if the confirmation be made to lie for life or years, of his term or estate, and not of the land, this doth not increas the estate; though if the liege confirm the land, to have and to hold to the liege and his heirs, this will enlarge the estate, and so of the rest. Co. Litt. 299. Plowd. 40.

In every good confirmation, there may be a precedent rightful or wrongful estate in him to whom made, or he must have the possession of the thing as a foundation on which the confirmation is to be edifying; the confirmer must have such an estate and property in the land, that he may thereby be enabled to confirm the estate of the confirmer; the precedent estate must continue till the confirmation come, so that the estate to be increased comes into it; and it is required that both these estates be lawful. Co. Litt. 296. 1 Rep. 146. Dyer. 189. 5 Rep. 15. If tenant for life make a lease for years to one perfon, and afterwards leave the land to another perfon for years; and he in reversion confirms the last lease, and after that the first lease, this is not good; the second lease hath an interest before the confirmation of him in reversion. But in a free cafe, confirmation of the first lease, after the second was confirmed, has been held good; for the lease takes no interest by the confirmation, but only to make it durable and effectual. Moor. e. 180. 1 Litt. 296. Plowd. 15.

If a difference confirm the land to the difeover but for one hour, one week, a year, or for life, &c. it is a good confirmation of the estate for ever; and if he confirm the estate of the difeover without any word of heirs, he hath a fee-simple; and if a difeover make a gift in tail, and the difeover dath confirm the estate of the donee, it shall endure to the whole estate. (Co. Litt. 291, 297, 298.) But where the estate is divided, it is otherwise; and if there be an estate for life, the remainder over, there the confirmation may be of either of the estates; and if the lease of a difeover of a lease for 20 years, make a lease for 10 years, the difeover may confirm to one of them and not to the other. (1 Cro. 472. 5 Rep. 51.) The tenant in tail in land hath a reversion in fee expectant; in this case, the confirmation of the estate tail will not extend to the reversion: &c. (Co. Litt. 297, 298.) If liege for years, without imprecation for waite, accept a confirmation of his estate for life, he hath by this loll the privilege annexed to his estate for years. (8 Rep. 76.) Acceptance of rent in some cases makes a confirmation of a lease: (2 Danv. 128, 123.) What a perfon may defeat by his entry, he may make good by his confirmation. (Co. Litt. 390.) But none can confirm, unless he hath a right at the time of the grant: he who hath but a right in reversion cannot enlarge the estate of a lease. (2 Danv. 140, 141.) As confirmation is to bind the right of him who makes it, but not alter the nature of the estate to his convenience, it shall not discharge a condition. (Poph. 51. 1 Rep. 147.) A confirmation will take away a condition annexed by law; and by confirmation, a condition after broken in a deed of feoffment is extinguished. (1 Co. Rep. 146.) Confirmations may make a detestable estate good; but cannot work upon an estate that is void in law. (Co. Litt. 295.)

A confirmation of letters patent, which are void as they are against law, is a void confirmation. (1 Lil. Abr. 295.)

Grants and leases of bishops, not warranted by the lit t. 52 Hen. VIII. c. 28. must be confirmed by dean and chapter.
CONFIRMATION.

chapter: and grants and leaves of parsons, &c. by patron and ordinary. (1 Indl. 247. 302, 303.) Bishops may grant leaves of their church-lands for 3 lives, or 21 years, having the qualities required by the fore-cited act, and concurrent leaves for 21 years, with confirmation of dean and chapter. (See 1 Eliz. c. 4, 10.) If a prebend be vacated by the death of its prebendary, and the bishop, who is patron, confirms it; this shall not hinder the succeeding bishop, without confirmation of dean and chapter, because the patronage is parcel of the possessions of the bishopric; but it shall hinder the present bishop, &c. (2 D. Nov. 1571.) If a parson grants a rent, the confirmation of the parson and bishop is sufficient without the dean and chapter, and shall be good against the succeeding bishop. (Ibid. 142.) The dean of Wells may put his possessions, with the affent of the chapter, without any confirmation of the bishop. (Ibid. 175.) See LEASE.

To the grants of a "flee corporation," as parson, prebendary, vicar, and the like, the patron must give his consent; because such a fole corporation has not the absolute fee; but a "corporation aggregate," as dean and chapter, matter, fellows and scholars of a college, &c. or any fole corporation that has the absolute fee, as a bishop with a conflict of the dean and chapter, may by the common law make any grant of their possessions without their founder's consent; and it shall be conclusive against the founder.

A confirmation, as we have already observed, is in nature of a release, and in some things of a greater force: and in this deed, it is good to recite the estate of the tenant, as also of him that is to confirm it, and to mention the confirmation; the words ratify and confirm, are commonly used; but the words grant, give, grant, stipufer, &c. by implication of law, may enter as a confirmation. (1 Indl. 295. Wilt. Symb. 1. p. 457.)

Confirmation, in Rhetoric, is, according to Quintilian, the third part, but according to Cicero, the fourth, of an oration, wherein the orator undertakes to prove, by laws, reasons, authorities, and other arguments, the truth of the propositions advanced in his narration. Cicero. De Inven. lib. i. cap. 14. 24. Quint. Inst. Orat. i. iii. e. 9.

Confirmation is either direct, or indirect: he first confirms what the orator has to urge for strength of his own cause; the second, properly called confirmation, refutes the opposite arguing of the adversaries. The two parts together are sometimes placed under the head or title of CONTENTION.

As to the forms of reasoning used by orators, for the purpose of confirmation, the Greek writers distribute them under four heads; viz. Syllogism, Ethymeme, Induction, and Example. (See each article, and also ARGUMENT and ARGUMENTATION.) Cicero reduces the rhetorical modes of reasoning to two, which he calls rationation and induction, comprising both syllogism and enthymeme under ratification, and example under induction; so that the difference lies in their manner of dividing them. As to the use of these modes of reasoning, it is proper to vary them in a discourse, and not to adhere too closely to the same form; for want of variety in this, as well as in other cafes, will soon create diggret. With regard to the disposition of arguments, or the order of placing them, some advise to put the weaker, which cannot wholly be omitted, in the middle; and such as are stronger, partly in the beginning, to gain the eftem of the hearers, and render them more attentive; and partly at the end, because what is last heard, is likely to be retained longest; and if there are but two arguments, to place the stronger first, and then the weaker; and after that to return again to the former, and induct principally upon that. But this must be left to the prudence of the speaker, and the nature of the subject. Nevertheless, it can never be proper to begin with the strongest, and to gradually descend to the weakest; for this would be a kind of antithesis in reasoning, which would be likely to destroy the effect. Arguments ought not to be crowded too closely upon that point; for then their force would be weakened, and the attention of the hearers would be so distracted, that they could not have sufficient time duly to consider them. Besides, more arguments than are necessary should not be used, because the fewer they are, the more easily they are remembered. In this respect, the observation of a great master of eloquence is very just, that "arguments ought rather to be weighed than numbered." Cic. de Orat. lib. ii. c. 76.

The confirmation is, as it were, the life and soul of the oration; in this the main ftrein of the argument lies. Whence Aristotle, properly enough, calls it ταύτας, διάτας.

Confirmation of Bishops. See BISHOP.

CONFIRMATION. in Theology, the ceremony of laying on of hands, for the conveyance of the Holy Ghost. When the apostles at Jerusalem heard that many of the inhabitants of Samaria had embraced the Gospel, and had been baptized, they sent thither Peter and John, who laid their hands on those new converts, and prayed that they might receive the Holy Ghost, and the Holy Ghost descended upon them. (Acts, 8.) And when the men of Ephesus had been baptized, "Paul laid his hands upon them, and the Holy Ghost came upon them." (Acts, xix. 6.) And St. Paul, in his epistle to the Hebrews, (vi. 2.) mentions the doctrine of the laying on of hands immediately after the doctrine of baptism. Upon these authorities was founded the practice, which prevailed in the primitive church, of persons receiving from the bishop immediately after baptism, a solemn benediction, accompanied with imposition of hands, upon the forehead with the holy chrism (made of oil and balsam), the sign of the Cross, and a prayer for the deponent of the Holy Ghost.

Among the ancients it was conferred immediately after baptism; and was esteemed in some measure, to be a part thereof: whence the fathers call it the accomplishment of baptism. The ground of the practice was an opinion of the imperfection of baptism, which in their apprehension was only prepared persons for the reception of the graces of the Holy Spirit, which were actually conferred in confirmation. To this purpose Tertullian says, "when we come out of the water, we are anointed with a blearied ointment, according to that ancient rite by which men were to be anointed for the priest's office with ointment out of a horn, ever since the time that Aaron was anointed by Moses; so that Christ himself had his name from chrisma. (See CHRISt.) Then we have the imposition of hands on us, which calls down and invites the Holy Ghost." (Tertull. de Baptism. c. 7.) King's Hist. of the Prim. Church, chap. v. p. 80, &c.) This ceremony was called confirmation, as it completed the admittance of the person into the Christian church, and qualified him to partake of the Lord's Supper. It was not confined to adults, but infants also received confirmation as soon as they were baptized, and an opportunity offered of presenting them to the bishop.

Among the Greeks, and throughout the East, it still accompanies baptism; but the Romanists make it a distinct and independent sacrament. The first express institution of this ceremony as a sacrament occurs in the decree of pope Eugenius in 1439, in which he says, "the second sacrament is confirmation, the matter of which is chrism blessed by the bishop, and though the priest may give the other unction, the bishop only can confer this." Peter Lombard, however, who lived in the 12th century, seems to have been the first who
who reckons seven sacraments, and mentions confirmation as one of them. Although this ceremony was generally performed by bishops, yet in some countries, as at some periods, it was performed by presbyters; but in that case it was necessary that the chrism should have been previously conferred by the bishop. St. Cyprian, and many of the fathers, speak of it in such terms as to imply, that the administration of it was confined to the bishop alone. Jerome tells us, that in his time, confirmation was always performed in the Latin church by bishops, as it had been in earlier times; and some have supposed that the custom of receiving the imposition of hands after baptism, to be performed by the bishop alone, commenced in the time of this father; though he himself did not think that the Holy Spirit was given by the imposition of the hands of the bishop only: and he says, they are not to be lamented, who, being baptized by presbyters or deacons in little villages, and cells, have died before they were visited by bishops. Hilary says, that in Egypt the presbyters confirmed in the absence of the bishop, but that the form was also determined by the council of Orange: and this was the practice of the Greek church, which did not allow confirmation to be a sacrament. From one of the canons of the council of Liberius we learn that, in the time of Cyprian and of Augustine, confirmation was performed by bishops. Hence Tertullian, and many of the moderns, lay it down as a distinguishing character between the offices of a priest or deacon, and that of a bishop, that the former might baptize, but the latter alone might anoint and confirm; by virtue of their succession to the apostles, to whom it originally belonged. But from some passages in St. Gregory, &c. others gather, that the priests, on occasion, had likewise the power of confirming.

It has been alleged, that, as confirmation always succeeded baptism, and made a necessary part of it, and several of the primitive Christians esteemed both necessary to salvation, it must have been performed by presbyters as well as by bishops; because the bishop of a church might be absent for a considerable time, as was the case with Cyprian, or the fee might be very small fee paid to the presbyters baptized, it is reasonable to conclude that they also confirmed. Lord King has shewn that confirmation and absolution were the same thing; and that presbyters, sometimes with the bishop, and sometimes without the bishop, did absolve by imposition of hands: and he has cited several ancient authorities in order to prove, that confirmation was frequently repeated with respect to the same persons. (Hist. Prim. Church, p. 91, &c.)

It is certain, among the Greeks, the priest who baptizes also confirms: which practice, Lucas Hellenius shews, is of so old a standing among them, that it is now generally looked on as belonging properly, and of right, to the priest: though some have it to have been borrowed by them from the bishops. Hence, some of the Latin divines acknowledge, that though the bishop be the ordinary minister of confirmation, yet, that the priest, in his absence, may also confer it, in quality of minister extraordinary.

The Council of Rouen, held in 1017, decrees that confirmation must be conferred falling, both on the side of the giver, and that of the receiver.

The ancients, and in this respect they are followed by the moderns, did not think this rate of confirmation to absolutely necessary, that the want of it would exclude from the kingdom of heaven those who had already been baptized; but they attributed to it so much importance, that they punished the neglect of it with marks of disgrace and public censure; and denied the privilege of ecclesiastical promotion and holy orders to such persons as had voluntarily and carelessly omitted it.

"After this example of the primitive Christians," says Dr. Tomlins, the bishop of Lincoln, "our church requires all who have been baptized to appear publicly in the congregation, and renew their baptismal vow according to the form prescribed in our liturgy." The order of confirmation requires, "that none shall be confirmed but such as can say the Creed, the Lord's Prayer, and the Ten Commandments, and can also answer to such other questions as in the Short Catechism are contained," &c. The bishop then questions them, whether they renew the solemn promise and vow that was made in their name at their baptism; ratifying and confirming the same in their own persons, and acknowledging themselves bound to believe and to do all those things which their god-fathers and god-mothers then undertook for them? The bishop in his general prayer declares before God that he hath vouchsafed to regenerate these, his servants by water and the Holy Ghost, &c. bath given unto them forgiveness of all their sins; and then laying his hand upon the head of every one severally, offers a prayer for each individual. Moreover, in the collection which forms a part of this service, he prays for those that are confirmed, saying, "upon whom, (after the example of thy holy apostles,) we have now laid our hands, to certify them (by this sign) of thy favour and gracious goodes towards them." The order forbids any to be admitted to the holy communion, but those who have been confirmed, or who are ready and desirous to be confirmed. This order of confirmation does not mention the proper age of the person to be confirmed.

This ceremony, says the bishop, "falls within the authority of the church, and may be considered as included in the general precept of doing all things in order and unto edifying;" especially since the now universal practice of infant baptism makes confirmation more necessary than it was in the primitive church, when chiefly adults were baptized. It seems highly reasonable that they, who, at the time of their baptism, were incapable of making any engagement, should, when they arrive at a proper age, ratify and confirm those promises which were made in their name. And to give this ordinance the greater solemnity, it is performed only by the higher orders of the church, the archbishops and bishops. Thus far our church receives confirmation, confining it to prayer and imposition of hands, without the chrism, or the sign of the cross, and believes it to be derived from the practice of the apostles. But as it is not a regular constitution of Christ and his apostles, like baptism and the Lord's supper, with a written command that it should be continued in future ages, and a promise that it will be attended with inward grace, we reject it as a sacrament. There is, indeed, not a single precept upon the subject in the New Testament; nor is there any episcopal authority for the use of the chrism or the sign of the cross; and Bingham thinks that the chrism made no part of confirmation before the latter end of the second century; though other writers attribute an earlier date to it. It must be admitted by all, that imposition of hands was not peculiar to confirmation; (See Matt. xix. 14.) Mark vii. 37. Luke, iv. 40;) and that no separate efficacy is ascribed to it different from the prayers which accompanied it; and prayer and imposition of hands are not sufficient to constitute a sacrament; we, therefore, consider confirmation as nothing more than a solemn manner of persons' taking upon themselves their baptismal vow; and as such, it is a ceremony of high importance, calculated to impress youthful minds with a just sense of the great obligations of the Christian profession, and to excite
excite in them an earnest endeavour "faithfully to observe such things as they, by their own confession, have assented unto." Elements of Christian Theology, vol. ii. p. 416.

It has been urged, however, that this ceremony, with respect to the real importance and utility of it, was peculiar to the times of the apostles: and though it is retained among Protestants, it is doubted whether it be a necessary instrument of grace.

Some have thought it a remnant of the pagan sacrament of confirmation; and that there is no more authority for retaining this remnant, than for any thing that is omitted in the ceremony. It has been said that the texts of scripture, repeatedly alleged in favour of this rite, have no weight.

To this purport it has been argued, that Peter's and John's going down to Samaria to pray, and to lay their hands on those whom Philip had baptized, furnishes no precedent, no direction, no institution, nor command for our bishops, to do likewise. The aid for which the apostles did it, as it is expressly fall (Acts vii. 15, 17.), was, "that they might receive the Holy Ghost," i.e. its miraculous gifts, such as prophesying, speaking with tongues, &c. necessary for forming them into a church; in proof of which it is urged, that they were something visible and obvious to sense; something which excited the wonder and ambition of the wicked persecutors; for it is said, "When Simon saw that through laying on of the apostles' hands the Holy Ghost was given, he offered them money." Bishops, Dr. Whitby has observed, that if they laid not their hands on all who were baptized, it makes nothing for confirmation; if they did, then Simon Magus also was confirmed, and received the Holy Ghost; which is not admissible. Our bishops, it has been said, disclaim the powers exercised by the apostles. As for the open and solemn renewal of the baptismal covenant before God, which baptized persons ought to make, when they come to years of discretion, this, it is said, is done in the sacrament of the Lord's supper, which Christ himself has appointed, and which is the only institution his wisdom has thought fit to appoint for this purpose. It has also been alleged that the ceremony of confirmation, however solemnly practiced, has a tendency, the more from the solemnity of its administration, to cherish in men's minds a presumptuous and false hope, and to decide them into wrong notions as to the safety of their state, and as to the terms of acceptance and favour with God. What warrant, it has been asked, has the bishop to pronounce a man's sins all forgiven, and himself regenerated by the Holy Ghost, when no other grounds than his being able to repeat the Lord's Prayer, Credo, and Ten Commandments, and the articles of the Short Catechism? Can it be said, that this is the Christian doctrine concerning the terms of acceptance and favour with God? Are good works and resolutions, declared in the church, infallible or proper proofs of a regeneration by the Holy Ghost? Is a man's professing that he repents, and promising that he will live a godly life, that actual repentance and amendment of life, which alone can ensure the divine pardon and favour? The multitudes, it is further said, who come to be confirmed, are taught to consider the bishop, in the exercise of that part of his office, as an ambassador of Christ, a successor of the apostles, and a special minister of God; and therefore, when they hear this sacred person, solemnly declaring that they are truly justified, pardoned, and regenerated by the Holy Ghost, can they be blamed if they believe it, and reft satisfiyed with regard to the safety and happiness of their state? And as full remission of sins, and the favour of God are to be had on such holy terms, is it matter of wonder, that thousands should eagerly flock from all quarters to accept it?

Or that persons of very vile and profligate characters should too often thrust themselves in to partake of this benefit, and be seen receiving upon their knees episcopal absolution, and solemn assurances of God's favour and peace?

It has been further argued by those who object to the continued practice of this ceremony of confirmation in the Christian church, that Tertullian is the most ancien author who has mentioned it, and that in his time, a great variety of forgeries, and ridiculous and foolish rites had been introduced and actually substituted in the Christian church.

Confirmation was then always performed, as we have already mentioned, (not as it is with us, but) immediately after baptism. The expression in our order of confirmation, by which the bishop declares to God, "that he hath vouchsafed to regenerate these his servants by water and the Holy Ghost, and to give them the forgiveness of all their fins," was probably taken from some ancient liturgy, and was suitable and well adapted to the practice of those times, but is incongruous and unuitable to ours. Then, as Dr. Cave observes, (Primitive Christianity, pt. i. p. 174, 228.) "although infants were undoubtedly taken into the church by baptism, yet the main body of the baptized were adult persons; who, flocking over daily in great numbers to the faith of Christ, were received in at this door. Usually they were for some considerable time catechized, and trained up in the principles of the Christian faith; till having given testimony of their piety in knowledge, and of a liberal and regular conversation, they became candidates for baptism," or, as Lord kay says, (Inquiry into the Constitution, &c. pt. i. p. 102.) "the catechumens enjoyed not the privileges of the faithful, till they had, in a sense, merited them, which was, when, through a considerable time of trial, they had evidenced the sincerity of their hearts, by the sanctity and purity of their lives. And then, as Origen says, we initiate them in our mysteries, when they have made a profession in holiness, and according to the utmost of their power have reformed their conversation. When they had changed their manners, and rectified their irregular carriage, then they were washed with the water of baptism, and not before. For, as Tertullian observes, we are not baptized that we may escape to sin; but because we have already escaped."

In these circumstances, it is said, the bishop or the presbyter might use an expression similar to that already cited with propriety; but the case is different, say the objectors to the permanent use of this rite, with the multitudes who flock to modern confirmations. Pierce's Vindication of the Church of England, is applied to goods forfeited to the exchequer, or public treasury.

The word is derived from δικαίωμα, a ransom, panion, or balsam, wherein the emperor's money used to be kept.

The title to goods, which are not claimed by any other, is given by law to the king. If a man, indicted for healing the goods of another, in which case they become, in effect, the proper goods of him indicted, be asked about them in court, and disclaim them; he thereby loses the goods, though he be afterwards acquitted of the theft; and the king shall have them as confiscate; but otherwise, if he had not disclaimed them. Thus afo, when goods are found in the possession of a felon, if he disavows them and afterwards is attainted for other goods, and not for the goods, the goods which he disavows are confiscated to the king; but if he had been attainted for the fame goods, they would have been said to be "forfeited and not confiscated." So an appeal of robbery be brought, and the plaintiff leaves out some of his goods, he shall not be allowed to enlarge his appeal; and because there is none to receive the goods so left out, the
king shall have them as confiscate, according to the rule, "Quod non caput Christian, caput infidelis." Staund. P. C. 1, c. 21. See Forfeiture.

CONFISCATION, a legal adjudication of goods or effects to the fice, or treasury.

Thus, the bodies and effects of criminals, traitors, &c. and merchandise that are contraband, prohibited, or brought aboard or afloat, without paying the duties, when seized, are confiscated.

It is an axiom in law, that he who confiscates the body, confiscates also the effects, to the profit of the king, or the lord of the fice, i.e. he who is condemned to lose his life, must also lose his goods; yet the widows of criminals do not lose their dowries, nor their share in the goods of the community, by the forfeiture of their husbands. See Forfeiture.

CONFABULATION, a general burning of a city, or other considerable place. In which sense, Nero is said to have procured the Christians to be sacrificed on the confabulation of Rome, which was done by his own order.

But the word is more ordinarily restrained to that grand period, or catastrophe of our world, wherein the face of nature is expected to be changed by a deluge of fire, as it was anciently by that of water. The ancient Chaldzeans, Pythagoreans, Platonists, Epicureans, Stoics, Celts, and Etrurians, appear to have had a notion of the confabulation; though whence they should derive it, uncles from the fabled books, it is difficult to conceive; except perhaps, from the Phcenicians, who themselves had it from the Jews.

The Celts, whose opinions resembled those of the eastern nations, held, that after the burning of the world, a new period of existence would commence. The ancient Etrurians, or Tuscan, also concurred with other western and northern nations of Celtic origin, as well as with the Stoics, in ascertaining the entire renovation of nature after a long period, or great year, when a simular succession of events would again take place. The cosmogony of an ancient Etrurian, preserved by Suidas, limits the duration of the universe to a period of 12,000 years, 6000 of which passed in the production of the visible world, before the formation of man. The Stoics also maintained, that the world is liable to destruction from the prevalence of moisture, or of drought; the former producing an universal inundation, and the latter an universal confabulation. Thus, they say, succeed each other in nature, as regularly as winter and summer. When the universal inundation takes place, the whole surface of the earth is covered with water, and all animal life is destroyed; after which nature is renewed, and subsists as before, till the element of fire, prevailing in its turn, dries up all the moisture, converts every habitation into its own nature, and at last, by an universal confabulation, reduces the world to its primitive state. At this period all material forms are lost in one chaotic mass, all animated nature is reunited to the Deity, and nature again exists in its original form, as one whole, consisting of God and matter. From this chaotic state, however, it again emerges, by the energy of the efficient principle, and gods and men, and all the forms of regulated nature are renewed, to be dissolved and renewed in endless succession. The doctrine of confabulation is a natural consequence of the general system of Stoicism. For, since, according to this system, the whole process of nature is carried on in a necessary series of causes and effects, when that operative fire which at first, burrowing from chaos, gave form to all things, and which has since pervaded and animated all nature, shall have consumed its nutriment, that is, when the vapours, which are the food of the celestial fires, shall be exhausted, a deficiency of moisture must produce an universal conflagration. This grand revolution in nature is, after the doctrine of the Stoics, thus elegantly described by Ovid, (Metam. l. i. v. 256):

"Esse quoque in fatis reminiscitur auro tempus
Quo mare, quo tellus, correptraque regio celi
Ardest, et mundi nubes operosa laboret;"
or, as Dryden has translated the passage,

"Remembering in the fate a time when fire
Should to the battlements of heaven aspire,
When all his blazing worlds above should burn,
And all the inferior globe to cinders turn."

Seneca, speaking of the same event, (Ad Marcum, c. ult.) says expressly, "Tempus advenit quo sidera sideribus incurren, et omni flagrante materia uno igne, quaeque nunc ex dep Scout lect, erubebit, &c. i.e. the time will come when the world will be consumed, that it may be again renewed, when the powers of nature will be turned again herself; when flares will rush upon flares, and the whole material world, which now appears repleteness with beauty and harmony, will be destroyed in one general conflagration. In this grand catastrophe of nature, all animated beings (excepting the universal intelligence), men, heroes, demons, and gods, shall perish together. Seneca, the tragedian, who was of the same school with the philosopher, writes to the same purpose, ( Herc. Od. iii. 1112.)

"Caeli regia concedens
Ortas atque obitus tetrab,
Atque omnes pariter deos
Perdit mortis atque, et chaos."

i.e. "The mighty palace of the sky,
In ruin fall'n a doom'd to lie,
And all the gods, its wreck beneath,
Shall sink in chaos and in death."

During the course of this vast conflagration, the Stoics conceived that the world would expand, and in its chaotic state continue to fill a much larger portion of infinite space than it had required, or would again require, in a state of orderly arrangement. After an interval of rest, says Seneca, (Epist. 9. Qu. Nat. c. ult.) in which the Deity will be intent upon his own conceptions, the world will be entirely renewed; every animal will be reproduced; and a race of men, free from guilt, and born under happier flares, will repeople the earth. Degeneracy and corruption, will, however, again creep into the world; for it is only while the human race is young, that innocence remains upon the earth. The grand course of things, from the birth to the destruction of the world, which, according to the Stoics, is to be repeated in endless succession, is accomplished with in a certain period. This period, or fate round of nature, is probably what the ancients meant by the "Great Year."

From this brief account of the doctrine of the Stoics concerning the final conflagration, it evidently appears, that it differs in several essential particulars from the Chaldee doctrine on this head. It is the work of fate, performed by natural and mechanical laws, and repeated eternally at certain periods, without any good reason, since with every revolution the same disorders and vices return. Philo justly ridicules this dogma; remarking, that the Stoics make their deities act like children, who raise up piles of sand only for

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The pleasure of beating them down. Several of the Stoics themselves were aware of the absurdity of this systen; and rejected it; particularly Boethus, Pythodorus, Diogenes the Babungian, and Pausanias. This general dissolution of the Stoics called "fzvulxvov. The Pythagoreans also maintained the dogma of conflagration. To this purpose the Hippophus, of Metaponto, taught that the universe is finite, is always changing, and undergoes a periodical conflagration. Philo, who flourished in the time of Plato, maintained that the world is liable to destruction, both by fire and water.

Mention of the conflagration is also several times made in the books of the Sibyls, Sophocles, Hylas, Eucus, Lucan, &c. Dr. Burnet, after F. Tachard, and others, relates, that the Samosela believe, that the earth will at last be parched up with heat; the mountains melted down; and the earth's whole surface reduced to a level, and then conformed with fire. And the Baramis of Sam do not only hold, that the world shall be destroyed by fire; but also, that a new earth shall be made out of the cinders of the old.

The sacred scriptures announce this event in a variety of passages; some of which, however, have been applied by Dr. Hammond, and others, to the destruction of Jerusalem; but others have universally allowed to refer to this awful catastrophe. See 2 Pet. iii. 12; Jer. 25. 1. Dr. Hammond to the destruction of Jerusalem, and the dissolution of the Jewish state, but generally, and, with just reason, applied to the end of the world. (See Ray's Difcourfe p. 371, &c.) 2 Theff. ii. 7. Rev. vi. 12, 13, 14. Rev. x. 6. Rev. xxi. 1. Heb. xii. 26, 27. All these passages, and others, which more immediately relate to the time of this event, are applied by Dr. Hammond to the destruction of the city, temple, and polity of the Jews: and, indeed, he leaves only one place in the New Testament, as a proof of the general conflagration of the world; viz. 2 Pet. vii. 7. Other passages have been cited from the Old Testament that seem to indicate and foretel the dissolution of the present globe: such are Heb. xiv. 12. Pl. cix. 5, 6. If. li. 6. Joel. ii. 31. Malachi. iv. 1. Deut. xxxii. 12. But it must be allowed that the prophetic books abound with figurative expressions, the precise object of which cannot be so satisfactorily ascertained. The ancient fathers of the church, and Chiliasm writers, in successive periods of its duration, have frequently referred to this event, and tried to fix its belief of its advent. Some of the first Chiliasm apprehended it to be near at hand; and many of the ancients conceived that it would take place in a single thousand years. In this number we may class Justin Martyr, Irenaeus, Lactantius, Eusebius, &c.; but their opinion, with regard to the precise time of this event, is proposed by them not as an undoubted truth, but only as a matter of conjecture. It was the general opinion of the ancient Christians, that this world shall not be annihilated or destroyed, but merely renewed and purified. To this purpose we might cite the testimonies of Eusebius, Cyril, Oecumenius, Jerome, and others.

Various are the sentiments of authors on the subject of the conflagration; the cause whence it is to arise, and the effects it is to produce. Divines ordinarily account for it metaphysically; and will have it take its rise from a miracle, as a fire from heaven. Philosophers contend for its being produced from natural causes; and will have it effected according to the laws of mechanics: some think an eruption of a central fire sufficient for the purpose; and add, that this may be occasioned several ways; viz. either by having its intensity increased; which, again, may be effected by the earth being driven into less space by the encroachments of the superficial cold, or by an increase of the inflammability of the fuel whereon it is fed: or by having the residence of igniting earth weakened; which may happen, either from the diminution of its matter, by the consumption of its central parts; or by weakening the cohesion of the constituent parts of the mass, by the excess or the defect of moisture.

Others look for the cause of the conflagration in the atmosphere; and suppose, that some of the meteors there engendered in unusual quantities, and exploded with unusual vehemence, from the concurrence of various circumstances, may be made to effect it, without seeking any further.

The astrologers account for it from a conjunction of all the planets in the sign Cancer; as the deluge, they say, was occasioned by their conjunction in Capricorn. This was an opinion adopted by the ancient Chaldeans.

Lastly: others have recourse to a still more effectual and flaming machine; and conclude the world is to undergo its conflagration from the near approach of a comet, in its return from the sun. Those wandering bodies do indeed seem to menace us a little; being able, both by their tranverse motion across the earth's way, by the hugeness of their size, and the intense fire wherewith they glow in their recells from the perihelion, to produce the most frightful changes and revolutions in the system of things.

Mr. Wilfon has shewn, that they are extremely well fitted to produce the phenomena of the deluge; and has gone a good way towards proving, that the comet of 1680—was the very body to which that event was owing; as being then in its approach towards the sun, and its atmosphere crowded with the watery vapours, which it had gathered in those inconceivably cold regions, into which it had fled off in its aphelion.

This same comet, for Isaac Newton has calculated, when in its perihelion, December the 8th, was heated, by the vicinity of the sun, to a degree two thousand times more hot than red-hot iron: he shews, likewise, that it would be cool again in fifty thousand years.

This same comet, Dr. Halley observed November the 11th, was not above a semidiameter of the earth from the earth's way: so that had the earth, at that time, been in that part of its orbit, something very extraordinary might have been apprehended; but whether in the way of fire, or water, may, perhaps, to some, leave room to doubt. But it is fearlessly conceivable, that the comet should bring anyvehement degree of heat, out of those regions it comes from, whatever heat it might carry with it. See Comet. See on the subject of this article Theory of the Earth.

CONFLANS, in Geography, a small town of France, in the department of Mont-blan, and chief place of a canton in the district of Moutiers, 18 miles N.E. from Moutiers. The place contains 1152, and the canton 5472 inhabitants. The territory includes 1824 square kilometres and 10 communes. Alto, a small town of France, in the department of Mofelle, and chief place of a canton in the district of Broye, situated at the confluence of the Iron and Or, 15 miles E. from Metz. This place contains but 347, and the canton 7495 inhabitants, and 31 communes, upon a territorial extent of 240 square kilometres. Alto, a town of France, in the department of the Upper Saone, in the district of Lure; 4 leagues N. of Vélon, and 23 W. of Luxeuil. Alto, a town of Savoy, near the conflux of the Iere and Daron; 18 miles E. of Chambery.

CONFLANS, or Conflant, was, before the revolution, the name of a valley of France, in Rouillon, surrounded by the Pyrenees, and watered by the river Tet. Villefranche sur le Tet was its capital.

CONFLANS
CONFLANS St. Honorine, a town of France, in the department of the Seine and Oise: 5 leagues S.W. of Paris.

CONFLICT. See Combat.

CONFLUENCE, Confluent, the place where two rivers join, and mix their waters.

CONFLUENT, in Medicine, literally flowing together, is a term applied to cutaneous eruptions, which, though confluent, on their first appearance, of separate and distinct spots, form themselves subsequently into extensive patches, by the spreading of the individual spots, which coalesce with each other. This epithet is most frequently applied to the smallpox, which, when confluent, becomes a very formidable and fatal disease, and requires a treatment in its latter stages, different from that which is beneficial in the mild form of the disease, when the pustules are few and distinct. See Small-Pox.

CONFLUENTA, in Ancient Geography, a town of Spain, belonging to the Vandaeans, S.E. of Palentia.

CONFLUENTES, who contend, that reflected light becomes of different colours, according to the different conformations of the bodies that reflect it. The conformation of the members of an embryo is not perfect enough to allow of distinction.

CONFORMITY, in the Schools, is the congruence, or relation of agreement between one thing and another: as between the measure, and the thing measured: the object, and the understanding: the thing, and the conception: the thing, and the division thereof, &c.

CONFORMITY, Non. See Non-conformity.

CONFORMITY, Occasional. See Occasional Conformity.

CONFRERES, from con, and frere, brother; denote brethren in a religious house, or the fellows of one and the same society. 3° Hen. VIII. c. 24.

CONFRACTION, the act of bringing two persons, in preference of each other, to discover the truth of one fact, which they relate differently.

The word is chiefly used in criminal matters; where the witnesses are confronted with the accused; the accused with one another, or the witnesses with one another.

CONFUCIUS, or Kong-Fu-tse, in Biography, the most celebrated ancient philosopher of China, descended from the imperial family of the dynasty of Shang, was born in the reign of the emperor Lu, about four centuries and a half before Christ. He was accordingly a contemporary with Pythagoras, and flourished at a period prior to that in which Socrates rose to celebrity. At fifteen years of age, he engaged in the study of the ancient learning of his country; and, before he had arrived at the years of manhood, he had made astonishing proficiency in the doctrines attributed to the legislators Yao and Chun, which the Chinese consider as the source of all their science and morality. The reputation which Confucius acquired, and the uncommon wisdom which he discovered, were the means of advancing him, while he was yet but a youth, to the office of minister of state. The duties of this, and of other posts assigned to him, he performed with honour to himself, and signal benefit to the kingdom. The rank which he held in public life, enabled him to form an accurate judgment of the state of morals among his countrymen. He devised a plan for a general reformation, which he endeavoured to carry into execution, as well by inculcating a strict and pure morality, as by using the influence of his authority in recommending it. His efforts were crowned with so much success, that the whole nation became, at first, a pattern of order, decency, and strict justice. This reformation was not, however, permanent; the butts of the flate was abandoned to men of licentious habits, and in a short time an universal effeminacy and disfigurements of manners prevailed. Confucius exerted all his powers to stem the torrent of vice; and when he found that his endeavours were fruitless, he resolved to quit his station and country, and seek an asylum in some other kingdom where his efforts in the cause of virtue might be more availing. He, at length, devoted himself to the task of private instruction in philosophy and morality. His great celebrity, and his personal virtues, soon procured him many scholars; and he is said to have had several thousand disciples to whom he taught morals, the art of reasoning, and the principles of policy. From these he selected seventy-two, who were distinguished from the others on account of their superior attainments. These were divided into classes, defined for different purposes. The butts of the first class was the study of morals; of the second, that of reasoning and eloquence; of the third, that of the rules of good government; and the immediate predecessor of the fourth was forming similar to our public preaching. The exertions of Confucius in the cause of virtue, were too great for the frame of body with which he was endowed; his natural strength became impaired, and his mental powers failed. During his last sickness, he declared that his heart was overpowered with grief, on beholding the disorders which prevailed in the empire, and which he had in vain endeavoured to suppress: "The kings," said he, "will not follow my maxims; I am no longer useful on earth; it is, therefore, time that I quit it." This exclamation was followed by a lethargy from which he never recovered. He died in his seventy-third year. B. C. about 479. (Blair.) By his sage counsels, his moral doctrine, and his exemplary conduct, he obtained an immortal name as a reformer of his country. After his death, his name was held in the highest veneration, and his doctrine is still regarded among the Chinese, as the basis of all moral and political wisdom. His natural temper was excellent, and his conduct irreproachable and exemplary. He was particularly praised for his uprightness, sincerity, temperance, dissimulation, and coetum of riches. Confucius seem to have been taught by heaven to reform, both by his doctrines and example, the corruptions which prevailed, as well as the civil, as in the religious establishments of China. He condemned the idolatry which his found exciting among his countrymen, and endeavoured to introduce a purer form of religion. He did not attempt to dive into the impenetrable secrets of nature, nor bewilder himself in abstruse researches on the essence of a first cause, the origin of good.
and evil, and other subjects which seem beyond the limits of the human mind. He maintained that the Deity was the most pure and perfect principle, and fountain of all things; that he is independent and almighty, and watches over the government of the universe, so that no event can happen but by his command; that our most secret thoughts are open to his view; that he is holy without partiality, and of such boundless goodness and justice, that he cannot possibly permit virtue to go unrewarded, or vice unpunished.

So high is the respect paid to the memory of this great man, even in the present day, that his descendants enjoy, by inheritance, the title and office of mandarins, and are allowed the privilege in common with the princes of the blood, of exemption from the payment of all taxes to the emperor. The works which Confucius composed for the use of his disciples, and the preservation of his philosophy, are looked upon by the Chinese as of the first authority, next to the classical books, by way of eminence, "the Five Volumes;" and to these, indeed, he declares himself indebted for the information and wisdom, which his own are calculated to convey. Moreci. Hist. Univ. D'Anquetil. Eschfield's Hist. of Philosophy.

Confused notion and fiction. See the substan
tives.

Confusion, in a general sense, is opposed to order; in a perturbation whereof, confusion confounds: e. g. when things prior in nature do not precede; or posterior do not follow, 

In a logical sense, confusion is opposed to distinctness, or periscopacy; and may happen, either in words, as when misconstrued or misapplied; or in ideas, as when the idea of any thing presents something with it, which does not properly belong to that thing.

In a physical sense, confusion is a fort of union, or mixture by mere contiguity. Such is that between fluids of contrary nature; as oil and vinegar, 

Confusion, property is, in Law, denotes the intermi
ixture of the goods of two persons in such a manner, that their respective portions cannot be ascertained. It is by

Content, they have a common interest, both by the Eng

lish and civil law, in proportion to their shares. But, if

One wilfully intermixes his money, corn, or hay, with that of another person, without his approbation or knowledge, or casts gold in like manner into another's pot or crucible, the civil law, though it gives the sole property of the whole to him who has not interfered in the mixture, yet allows a satisfaction to the other for what he has so improperly lost. (Int. 2. 1. 25.) But our law, to guard against fraud, gives the entire property, without any account, to him, whose original dominion is invioled, and endeavored to be rendered uncertain, without his own consent. Poph. 38. 2 Bulltr. 325. 1 Hal. P. C. 513. 2 Vern. 516. Bl. Comm. ii. 455.

Confusion of tongues, in the History of the World, is a memorable event, which happened in the one hundred and fifteenth year, according to the Hebrew chronology, after the flood. B. C. 2247, at the overthrow of Babel; and which was providentially brought about, in order to fa
cilitate the dispersion of mankind, and the population of the earth. Until this period, there had been one com
mon language, which formed a bond of union, that pre
vented the separation of mankind into distinct nations; and some have supposed, that the tower of Babel was erected as a kind of fortress, by which the people intended to de
fend themselves against that separation, which Noah had projected.

There has been a considerable difference of opinion, as
to the nature of this confusion, and the manner in which it was effected. Some learned men, propounded with the notion that all the different idioms now in the world did at first arise from one original language, to which they may be reduced; and that the variety among them is no more than must naturally have happened in a long course of time by the mere separation of the builders of Babel, have main

tained, that there were no new languages formed at the confusion; but that this event was accomplished by creating a misunderstanding and variance among the builders, without any immediate influence on their language. But this opinion, advanced by Le Clerc, 

seems to be directly con-trary to the obvious meaning of the word כְּפָרִי, shapha, שפרי, used by the sacred historian; which, in other parts of scripture, signifies speech. (See Ps. xxxvi. 5. Is. xxviii. 11. xxxiii. 19. Ezek. iii. 5.) It has been justly remarked, that unanimity of sentiment, and identity of language, are particularly distinguished from each other in the history; that the people is one, and they have all one language. (Gen. xi. 6.) It has been also suggested, that if disagreement in thought and conceptions arose out of that. This tended, it would have had a contrary effect; they would not have deceived from their project, but frequently have maintained their respective opinions, till the greater number of them had compelled the minority either to fly or to submit. Others have imagined, that this was brought about by a temporary confusion of their speech, or rather of their apprehensions, causing them, whilst they continued together and spake the same language, to understand the words dif
differently: Scaliger is of this opinion. Others again account for this event, by the privation of all language, and by supposing that mankind were under a necessity of associating together, and of imposing new names on things by common consent. Another opinion ascribes the confusion to such an indistinct remembrance of the original language which they spake before, as made them speak it very dif
differently; so that by the various inflections, terminations, and pronunciations of divers dialects, they could no more understand one another, than they who understand Latin can understand those who speak French, Italian, or Spanish, and the like.

This opinion is adopted by Caufaban, and by bishop Patrick in his Commentary in loc. and is certainly much more probable than either of the former; and Mr. Shuckford maintains, that the confusion arose from small beginnings, by the invention of new words in either of the three families of Shem, Ham, and Japhet, which might contribute to separate them from one another; and that in each family new differences of speech might gradually arise, so that each of their families went on to divide and subdivide among themselves. Others, again, as Mr. Jof. Mele and Dr. Wotton, 

not satisfied with either of the foregoing methods of accounting for the diversity of languages among mankind, have recourse to an extraordinary interposition of divine power, by which new languages were framed and communicated to different families by a supernatural infusion or inspiration; which languages have been the roots and originals from which the several dialects that are, or have been, or will be spoken, as long as this earth shall last, have sprang, and to which they may with more or less be reduced. This opinion is adopted and vindicate
d by Dr. Hartley, in his Observations on Man,

p. 170, where says, that it seems impossible to explain how the human languages should arise from one flock. Upon the whole, we may observe, that there evidently seems to have been something miraculous in the transmutation; and if it be supposed that nothing more was meant than a confusion of design, counsels, and opinions; so that they could not
agree together in the execution of their scheme (which, as we have shown, is not very probable); this would be sufficient to answer the purpose of Divine Providence, which was to prevent the children of Noah from preserving their union in one body, and to spread them over the face of the earth, that it might be peopled and cultivated. If the confusion of tongues was an actual change of languages, it was probably accomplished by degrees; nor does it appear to be so fundamental and radical an alteration as some have imagined. In proof of this, we may allege the free intercourse which subsisted in early times between persons of different ages and countries; the uniformity of the Eastern languages, which plainly shows that they have one common radix; and the manifold derivation of the Greek and Latin from the same source.

As to the number of languages thus introduced, many opinions have been adopted. If there were no more than there were nations or heads of nations, then the number would be seven for Japhet, four for Ham, and five for Shem; but if there were as many as there were families, which is the more probable opinion, their number cannot be certainly ascribed. However, the Hebrews fancy they were seventy, because the descendants of the sons of Noah, enumerated Genesis x., were just so many. Allowing then the languages of the chief families to have been fundamentally different from each other, the sub-languages and dialects within each branch would probably have had a mutual affinity, greater or less, as they settled nearer or farther from each other. But whichever of these hypotheses is adopted, the primary object of the confusion at Babel was the separation and dispersion of mankind. Cleric. Com. in Gen. i. Scaliger Exerc. in Cardan. §§ Culfauon. Distr. de Ling. Heb. Mede's Works, vol. i. p. 276. Wotton's Difc. and Brett's Eff. on the Confutation of Languages. Univerf. Hist. vol. i. part i. chap. 2. § 5. Shuckf. Conr. vol. i. p. 146.

The ingenious and learned Dr. Bryant has, in the third volume of his "Analysis of Ancient Mythology," advanced a new and singular hypothesis, both with respect to the confusion of tongues and the dispersion. He supposes that the confusion of language was local and partial, and limited to Babel only. By מיל, Gen. xi. 1 and 8, which our translators render the whole earth, he understands every region: and by the same words in ver. 9, the whole region, or province. This confusion was occasioned, as he supposes, by a labial failure; so that the people could not articulate. Thus their speech was confounded, but not altered; for as soon as they separated, they recovered their true tenor of pronunciation, and the language of the earth continued for some ages nearly the same. The interviews between the Hebrews and other nations, recorded in Scripture, were conducted without an interpreter; and he farther observes, that the various languages which subsisted at this day retain sufficient relation to show, that they were once dialects from the same matrix, and that their variety was the effect of time. See Dispersion.

CONFUTATION, in Rhetoric, &c. a part of an oration, wherein the orator secedes his own arguments, and strengthens his case, by refilling and destroying the opposite arguments of the antagonist. This is done by denying what is apparently false, by detecting some flaw in the reasoning of the adverse party, by granting their argument, and shewing its invalidity, or retorting it upon the adversary.

Confutation makes a branch of what we call confirmation. The confirmation and confutation are sometimes called content. Rhetoricians generally place confutation after confirmation, which seems agreeable to the natural method of thinking on any subject. For persons first endeavour to find out such arguments as are proper to maintain that side of a question which they defend, before they consider what objections may be offered against it: although in speaking it may be necessary to vary the order, according to the nature of the discourse. The method preferred by Quintilian (Inst. Orat. i. c. 13.) is this, that, "if we bring a charge, we should first prove it, and then answer objections; but if we stand upon the defence, we ought to begin with confirmation." The forms of reasoning are the same here as those that occur under confirmation. But it is of importance to keep him with his own weapon. Sometimes practiced by orators, which is often the more difficult task; because he, who is to prove a thing, comes usually prepared; but he, who is to confute it, is frequently left to a sudden answer. Hence Quintilian says, that, in judicial cases, "it is as much easier to accuse than to defend; as it is to make a wound than to heal it." In all disputes it is of the greatest consequence to observe, where the fires of the controversy lies; and in confutation, what the adversary has advanced ought carefully to be considered, and in what manner he has expressed himself. Those things, which relate to the merits of the cause, may be confuted either by contradicting them, or by shewing some mistake in the reasoning, or their invalidity when, granted. There are various ways in which things may be contradicted; what is apparently false may be expressly denied; and things which the adversary cannot prove may be likened denied. A thing may be also contradicted by shewing that the adversary himself maintained the contrary. When you can fix contradictions on an adversary, you effectually silence him; for this is stabbing his heart; this is not to express terms denied, but repressed to be utterly incredible; and this method exposes the adversary more than a bare denial. There is, likewise, an ironical way of contradicting a thing, by retorting that and other things of the like nature upon the adverse party. A second mode of confutation is by observing some flaw in the reasoning of the adverse party. The last method of confutation is, when the orator does in some measure grant the adversary his argument, and at the same time shews its invalidity. This may be done in a variety of ways, according to the different nature of the subject. Sometimes he allows that what was laid may be true, but pleads, that what he contends for is necessary. At other times the orator pleads, that although the contrary opinion may seem to be attended with advantage, yet that his own is more just and honourable. Another way of confutation is by retorting upon the adversary his own argument. The orator takes this advantage, when an argument proves too much, that is, more than the person designed it for, who made use of it. See Inversion. Sometimes orators in confutation raise false objections themselves, to what they have said, as they imagine may be made by others; which they afterwards answer the better to induce their hearers to think, that nothing considerable can be offered against what they have advanced, but what will admit of an easy reply. See PROLEPSIS. See the several modes of confutation above noted, illudinated by appropriate citations from Cicero's Orations in Ward's Oratory, vol. i. p. 17.

As to the order and disposition of the arguments, proper to be used in confutation; whether to follow the adverse party, or alter his method, and range them in a different manner
maner, as likewise whether to attack the weak-fl or strong-

est arguments first; these things must be left to the direc-
tion of the speakers.

CONG, in Geography, a village of the county of Mayo, Ireland, situated in the neck of\nland between the Loughs, Mallow and Corrib. Large caverns and subterraneous
taters are frequent in the neighbourhood; especially at the
back of the village, a very broad river rushes at once from
beneath a gently sloping bank, and after a rapid course of
about a mile loses itself in Lough Corrib. It is supplied
with the outlet of a subterraneous channel, through which
the superfluous waters of Loughs Mallow and Carrall are dis-
carged into Corrib. Cong is about 108 miles west from
Dublin, and 20 south from Castlebar.

CONG, a town of China of the third rank, in the pro-
vince of Honan; 15 miles south of Honanking.—Allo, a
town of China of the third rank, in the province of Se-
chuen; 25 miles south of Soui-teou.

CONGO, a town of Peru, in the province of Irish-
Agemi; 100 miles N.W. of Ipapan.

CONGAREE, a considerable river of America, in the
state of S. Carolina, formed by the conjunction of Saluda
and Broad rivers. The union of the waters of Congaree and
Waterco forms the Santee.

CONGHO, in Ancient Geography, a station on the
live of Severus wall in Britain, mentioned in the Notitia
Imperii, and supposed to be at Stanwix.

CONGE, APOGOGIE, Gr. Sopus, Lat. in Architec-
ture. The extremities of the frail of a column when they
are worked circularly to unite gradually with the foilets of
the bafe and capital are thus named.

CONGE, in the French Law, a licence, or permission,
granted by a superior to an inferior, which gives him a dis-
fpenation from some duty to which he was before obliged.
The word is French: Menage derives it from the Latin
communiatus, used for communis, and commune, often seen
among ancient writers: the Italians say, congolo.

A monk cannot go out of his convent, without the conge
of his superiors.

CONGE d’accorder, i.e. leave to accord, or agree, is used in
the statute of fines, anno 1 Edw. I. to the following pur-
pose: "When the original is delivered, in presence of the
parties before justice, a plainer shall say this: Sir justice,
conge d’accorder, and the justice shall saie to him, What
faith in R. and shall name one of the parties, &c."

CONGE d’honneur is the king’s privilege royal to a dean
and chapter, in time of a vacancy, to choose a bishop. See
BISHOP, CANON, AND COLLAETION.

Gwyn observes, that the king of England, as sovereign
patron of all bishops and other benefices, had, according to the
free appointment of all ecclesiastical dignities; investing,
first, per baculum & annulum; and afterwards by letters pa-
tent: but that, in passage of time, he made the election
over to others, under certain forms and conditions; as,
that they should at every vacancy, before they chose, demand of
the king conge d’honneur, i.e. leave to proceed to election; and
after election to crave his royal assent, &c. He adds, that
king John was the first who granted this; which was after-
wards confirmed by flat, Welfm. 3 Edw. I. cap. 1. and
again in the Articuli Cleri, 25 Edw. III. cap. 1.

CONGE, in Military Language, leave of abasement
given to an officer or soldier from his corps, from the army or alto-
tgether from the service. The old service of France admitted
of two kinds; namely, the conge limite, a specific or li-
mitted leave, and the conge absolu, or an absolute discharge.
In the latter case there was delivered to the soldier a cir-
touch, with all the signatures on it necessary for the good
order and regularity of the service, and for the tranquility
of the person, who obtained it. The conge absolu was al-
ways followed in time of war.

CONGEABLE, from the French conge (i.e. have, li-
ence, or permission), signifies as much as lawful, or lawfully
done, or done with leave or permission; as, then entry of the
difficulty is congeable.

CONGELATION (from the Latin congello), means the
transition of a solid into a fluid state, in consequence of the
abstraction of heat; thus metals, butter, oils, water, &c. are
said to congeal, when, from a fluid state, they pass into that of
a solid.

Congelation and freezing mean, in fact, the same effect;
yet the term congelation is indiscriminately applied to all the
above-mentioned transitions; whereas the word freezing is
more commonly used for denoting the congelation of water,
of vinegar, of brandy, of mercury, and in that of all those
substances which, in order to become solid, must be cooled be-
low 32° of Fahrenheit’s thermometer. We shall, however,
in this work, divide the subjéct of congelation under the
two above-mentioned denominations; freezing, under the pre-
fent article, whatever relates to natural congelation, and un-
der the article FREEZING, whatever relates to the artificial
methods of freezing.

Another important process, much connected with con-
gelation, has been improperly separated from it. And this is
crystallization, or the arrangement of certain substances
into regular figures, in their transitions from the fluid into
the solid state; but water and several other bodies likewise
crystallize in congelating, which shows that the two process-
can hardly be separated; and this is rendered still more evi-
dent by a due consideration of other phenomena that accom-
pany both processes. Allowing therefore that crystalliza-
tion and congelation are essentially of the same clafs, a flight
differentiation may be formed by applying the term crystal-
lization to the formation of those regular forms or crystalls,
which are of a compound nature, and which, when once
formed, generally require a much greater degree of heat for
their liquefaction, than that in which they were formed.

By far the greater number of liquids we are acquainted
with, have been found capable of congelation in a proper
temperature; and on the other hand most of those solids
which are both in the usual temperature of the atmosphere
may be rendered fluid by the application of certain appro-
priate degrees of heat: hence we are led by analogy to sup-
pose, that every fluid might be congealed, if it were possible
to cool it sufficiently; or that fluidity is the effect or con-
sequence of heat. Every particular kind of substance re-
quires a different degree of temperature for its congelation;
hence it appears why certain substances remain always fluid,
while others remain always solid, in the ordinary tempe-
ration of the atmosphere, and why certain other substances
are sometimes fluid, and at other times solid, according to
the vicissitudes of the weather, the difference of seasons, and
the variety of climates.

Heat, or sensible caloric, continually tends to pass from
those bodies which have more of it than their proper share,
to those contiguous bodies which have less of it than their
proper share; hence, when a body is placed among other
bodies of a lower temperature, its heat gradually passes to
those other bodies, until the whole acquires the same tempe-
ration; and this transition proceeds regularly, excepting,
however, when the body is in the act of affuming the solid
state; for at that moment a sudden extraction of heat is
observable. Place a thermometer in a glass full of water,
and place the glass in a freezing mixture of broken ice, and common salt, the thermometer will be found to descend gradually as low as 39, or 25 degrees of Fahrenheit's thermometer, and sometimes even much lower, whilst the water remains fluid; but, at last, the water begins to freeze, and at that very moment the thermometer rises suddenly to 32°, and it remains at that point until the whole of the water is congealed. If then the application of the freezing mixture is continued, the thermometer will sink gradually several degrees below 32°, according to the activity of the freezing mixture. We may, Dr. Black observes, easily satisfy ourselves, that the water, while congealing, is continually imparting heat to the surrounding air; for, if we suspend a delicate thermometer immediately above the water, we shall find the instrument affected by an ascending stream of air, less cold than the air around.

Not only pure water, but all aqueous fluids, may be cooled down 7, or 8, or 10 degrees without freezing; but if in that state they be affected with a tumultuous motion, or if they be touched with a slender piece of ice, they will instantly cool into beautiful spicules, the thermometer in it rising at the same time. This striking phenomenon of the sudden rising of the thermometer at the moment of congelation, which has also been remarked in wax, spermaceti, and other substances, has not yet been fully or satisfactorily explained. It is true that ice has not so great a capacity for containing heat as water has; (see the capacities of bodies under the article Caloric and Heat;) but why should water so reluctantly part with such a superfluous quantity of heat as to suffer itself sometimes to be cooled several degrees below 32°, before it will assume the solid form?

Since water, when it has once begun to congeal, remains at the apparent temperature of 32° until the whole of it is congealed; and since water cannot remain congealed in a temperature higher than 32°; therefore the congealed point of water has been fixed at 32°, of Fah.

The congealing points of several other substances have also been ascertained with considerate accuracy. In some, however, it is not the congealing, but the melting, point that has been ascertained. These two points, if they be not quite the same, may naturally be supposed not to differ more than about a degree or two; hence from the latter the former may be easily deduced. In the following table, however, we shall set down the one or the other of those points, according as either of them has been more accurately determined.

<table>
<thead>
<tr>
<th>Substance</th>
<th>Melting Point (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Platinum</td>
<td>3177°</td>
</tr>
<tr>
<td>Manganese</td>
<td>2887°</td>
</tr>
<tr>
<td>Iron</td>
<td>2163°</td>
</tr>
<tr>
<td>Nickel</td>
<td>2057°</td>
</tr>
<tr>
<td>Pig iron begins to melt</td>
<td>1797°</td>
</tr>
<tr>
<td>Cobalt</td>
<td>1290°</td>
</tr>
<tr>
<td>Fine gold</td>
<td>1267°</td>
</tr>
<tr>
<td>Setting heat of flat glass</td>
<td>104°</td>
</tr>
<tr>
<td>Fine silver</td>
<td>according to Mr. Wedgewood 4717°</td>
</tr>
<tr>
<td>Swedish copper</td>
<td>4587°</td>
</tr>
<tr>
<td>Brass</td>
<td>3007°</td>
</tr>
<tr>
<td>Zinc</td>
<td>700°</td>
</tr>
<tr>
<td>Lead</td>
<td>according to Newton 540°</td>
</tr>
<tr>
<td></td>
<td>according to Seconat 575°</td>
</tr>
<tr>
<td></td>
<td>according to Irwin 594°</td>
</tr>
<tr>
<td></td>
<td>according to Parker 612°</td>
</tr>
</tbody>
</table>

Lead fixes, according to Crichton of Glasgow 619° F.

Bismuth melts { according to Irwin 472°

A mixture of one part of tin and four of lead, melts 476°

Tin melts { according to Irwin 443°

The last mentioned gentleman says, "In melted tin the thermometer funk gradually till it arrived at 442°; then it instantly funk to 439°; and as instantly rose to 442°. At this temperature the mercury remained perfectly stationary for five minutes, at which time the metal became solid to the centre of the crucible.

A mixture of three parts of tin and two of lead, melts 334°

A mixture of two parts of tin, and one of bismuth, melts 283°

A mixture of tin and bismuth, in equal parts, melts 212°

A mixture of three parts of tin, five of lead, and eight of bismuth, melts 219°

Serum of blood begins to coagulate at 125°

Albumen, or the white of an egg, coagulates at 155°

Bee's wax melts 134°

Tallow melts 127°

Spermaceti melts 112°

Ice, or congealed water, begins to melt 52°

The increase of the bulk of water previous to, as also following, its point of congelation is a remarkable property, which has been more or less observed with all aqueous fluids, viz., they are contracted by cold, until a certain limit, which generally is about 7 or 8 degrees higher than their congealing point; they then expand again as they are cooled farther, and if they are not agitated, they will remain liquid at a temperature lower than their congelation point. The greatest density of water, Count Rumford says, is some what lower than 40°. Professors Hope of Edinburgh places it between 39°.5 and 40°. Mr. Dalton says, that the greatest density of water is at the temperature of 42°.5. And that the expansion of water is the same at the distance of the same number of degrees above and below 42°.5. Thus the expansion is the same at 32° and 52°; the same at 16° and 75°, c. The increase of bulk in freezing water is not owing to the formation of air bubbles, for water, which has been deprived of air, will also expand in freezing. The bulk of ice, at a mean, is to that of the water which it produces, as 10 to 8. This enlargement of bulk is attributed to a crystallization; the particles of water in freezing tend to arrange themselves so as to form angles of about 60 and 120 degrees; and this tendency is exerted with a prodigious force. Mr. Leslie says, "water necessarily discharges its air previous to the act of congelation; a circumstance which sometimes retards that species of crystallization. Hence it is, that water freezes sooner which has been boiled. When exposed to cold, crude water will present a lake of ice crowded with large bubbles entangled in the mass; but boiled water will contain a solid lump, almost pellicid, with only some minute specks or bits floating from the centre." Dr. Black says, that boiled water begins to freeze as soon as the air has cooled it to 32°. Iron likewise occupies less room when fluid than when solid. And the same thing has been ascertained of two or three other metallic substances.

Vinegar
Vinegar congeals at about **28° F.**

Human blood congeals at **25°.**

Strong wines congeal at about **20°.**

A mixture of one part of alcohol and three of water congeals at **7°.**

A mixture of alcohol and water, in equal parts, congeals at **minus 4°.**

A mixture of two parts of alcohol and one of water, congeals at **minus 7°.**

Mercury congeals at **minus 39°.**

Mercury exposed to cold, and at about the point of congealation, contracts its bulk irregularly. This fluidity may be cooled some degrees below its freezing point, before it assumes the solid form; but as soon as it begins to harden, the thermometer rises to its freezing point, which, from a variety of experiments made by Mr. Hutchinson at Hudson's Bay, appeared upon his thermometer to be **-40°.** But (Mr. Cavendish observes in the Phil. Trans. vol. lxxiii. p. 321.) as it appeared from the examination of his thermometer, after it came home, that **-20° thereon answers to -58° on a thermometer adjusted in the manner recommended by the committee of the Royal Society; it follows, that all the experiments agree in showing that the true point at which quicksilver freezes, is -76°, or in whole numbers **39° below nothing.**

In becoming solid, mercury sometimes flows into crystals or longitudinal filaments like pins. The first observations concerning the natural congelation of mercury were made by Mr. Gmelin about the year **1735,** at Yenpeck in lat. **58° 3' north,** at Yakutsk in lat. **62° 6' north,** at Rivengo, lat. **53° 6' north,** and elsewhere. (See the Peterburg Commentaries for the years 1756 and 1763.) Professor J. A. Braun, of Peterburg, in the year 1759, first accomplished the congelation of mercury by art, viz. by means of snow and aqua fortis. But with respect to the artificial methods of congealing mercury, and their history, see the article Freezing.

Nitric acid is said to congeal at **minus 46°.**

With respect to the congelation of the sulphuric, or vitriolic acid, the greatest number of experiments seems to have been made by Mr. Keir, and from those experiments he infers: *1.* That the vitriolic acid has a point of eafeful freezing, and that this is when its specific gravity is to that of water as **1762** to **1000.** *2.* That the greater or less disposition to congelation does not depend on any other circumstance than the strength of the acid. *3.* That the freezing and thawing degree of the most congealable acid is about **4° 5′** of Fahrenheit's scale. It is, however, to be observed, that this degree is inferred from the temperature indicated by the thermometers immered in the freezing and thawing acids; but the congelation of the fluid acid could never be accomplished without exposing it to a greater degree of cold, either by exposing it to the air in frosty weather, or to the cold of melting snow. *4.* Like water, this acid possesses the property of retaining its fluidity when cooled several degrees below the freezing point; and of rising suddenly to it when its congelation is promoted by agitation, or by contact even with a warmer thermometer. *5.* That, like water and other congealable fluids, this vitriolic acid generates cold by its liquification, and heat during its congelation, though the quantity of this heat and cold remains to be determined by future experiments. *6.* That the acid, by congelation, when the circumstances for distinct crystallization are favorable, assumes a regular crystalline form, a considerable solidity and hardnefs, and a densiity much greater than it possessed in its fluid state."

The heat of the earth, at least on the surface of it, is derived entirely from the sun; for the heat arising from combustion, as about volcanoes, or from decomposition of bodies, is trifling and partial. The direct rays of the sun on the same spot of the surface of the earth heat it more or less, according to the time of the year, cleanness of the atmosphere, state of the winds, color and quality of the spot. In Great Britain, during the hottest time of the summer season, the direct rays of the sun seldom raise the mercury in the thermometer to high as **110°.** But in other climates, especially within the tropics, the mercury is raised considerably higher by the direct exposure. Yet we must not believe the idle stories of the sun's heat melting lead, or setting fire to gunpowder, without the assistance of lenses, spectacles, or other artifice.

It is not on account of the sun's being nearer or farther from the earth, that we receive much more or less heat in the summer than in the winter time; since the difference of that through the rays of the sun is relatively small; but we receive more heat in the summer than in the winter season. 1. Because the sun comes nearer to our zenith in the summer than in the winter time, in which situation its rays pass through a shorter portion of the atmosphere, and of course are less intercepted by it. 2. Because, when the sun is nearer to the zenith, a greater quantity of its rays falls upon a given horizontal part of the surface of the earth, than when luminaries falls lower, and its rays fall more obliquely upon the same spot. 3. Lastly, because the sun remains longer above the horizon during a summer day than a winter one.

The hottest part of the day is not at noon, nor that of the year when the sun passes nearest the zenith of a given country; but the hottest part of the day, when no accidental circumstance intervenes, is some time in the afternoon, and nearer to noon in the winter than in summer. In this country and in summer, the hottest part of the day generally is either precisely at, or a little before, two o'clock. The hottest time of the year in this country generally takes place in July, viz. after the fulltide. The reason of this is, that although the rays of the sun give more heat when the sun stands higher, and of course at two o'clock they must give less than at noon; yet the earth, and the air contiguous to it, are hotter at two o'clock, because, besides the heat which they are actually receiving from the sun, they retain considerable portion of the heat acquired before that time; so that as long as they acquire at any particular time, a greater quantity of heat than they lose of that which they had previously acquired, their temperature must continue to increase. The same thing must be understood with respect to the communication of cold, which, for similar reasons, is greatest some time after midnight, and some time after the shortest days of the year. The earth acquires heat in the day time, and loses it during the night. In the summer season the loss of heat during the night is less than the acquisition of it during the day; therefore that excess of heat is gradually communicated from the surface to the more internal parts of the earth. But when the above-mentioned summer heat has penetrated a certain way, the winter cold begins to counteract it; and when that cold has penetrated a certain way, the next summer heat begins again to counteract it, and so on; hence, below a certain depth there is no alteration of temperature at any time of the year; unless some local combustion or other source of heat should interfere, which, however, seldom occurs. This fixed degree of temperature at a certain depth below the surface of the earth, varies in different countries, and nearly coincides with the mean temperature of the particular country. Thus in London the mean temperature is **50°;** and if a bucket of water be drawn from a pretty deep well, and a thermometer be
be instantly placed in it, the temperature of that water, (which is the same as that of the ground surrounding the bottom of the well) will also be found to be 50°. In processes of time the mean temperature of a country is liable to some alterations arising from cultivation, clearing of grounds, draining of marshy grounds, &c. See Climate.

With respect to the temperature at different altitudes, it has been found that a thermometer placed close to the ground is sometimes affected by heat or cold, sooner, or in a greater degree, than a thermometer placed 20, or 30, or 60 feet, higher up; and that at other times the latter is affected sooner, or in a greater degree, than the former. In the middle night, especially when the air is still, and the sky quite free from clouds, a thermometer close to the ground generally indicates a greater degree of cold than in a higher situation. The true cause of this phenomenon is not fully understood; though it is attributed to evaporation, or according to Mr. Six, to the coolness which the dew or vapours may acquire in their descent.

At great heights above the surface of the earth, either in the free air, or on the summit of high mountains, the cold is much greater, and it increases more suddenly: but, because they are much more exposed, and daily, because they are more remote from the body of the earth, which, as has been observed above, tends to equalize the temperature, by retaining in the winter time a considerable degree of the heat acquired in the course of the summer. The winds to which mountains are exposed, especially those which, after having blown over the plains below, rise along their sides, have a peculiar refrigerating power, arising from the expansion of the ascending air, which becomes capable of absorbing more heat in proportion as it is more rarefied. See Dr. Darwin's Paper, Phil. Trans. for 1788.

Thus we have briefly stated the natural sources, and the principal causes which check or promote the heat and cold, that are usually experienced in the world, at different times of the day, of the year, and in different countries; whence alone one may pretty well conceive where and when natural congelation may be expected to take place. Yet it is necessary to subjoin some farther observations, that have been made with respect to natural congelation at different times and different places.

The greater obliquity with which the sun's rays fall upon the northern and southern parts of the earth, than they do upon such parts as are near the equator, undoubtedly produces the variety of the mean temperatures that are observed in different latitudes; the higher latitudes being generally colder than the lower, and vice versa. But this gradation is partly counteracted by a variety of other circumstances; and such are the vicinity of large tracts of land or great extent of sea, the face of the country being flat or hilly, the disposition of the hills and mountains, the prevalence of rain and of certain winds, the state of cultivation, &c. The influence of winds in certain latitudes is so very great that a fruit or thaw is brought on within a remarkably short time by a change of the wind. The action of winds on the temperature of a country principally depends upon three circumstances, viz. on their bringing a quick succession of new air in contact with the bodies that are exposed to it, on their having passed over the surface of hotter or colder tracts of water or land, and upon their increasing the evaporation. Sauvages found that when the wind moves at the rate of forty feet per second, it triples that quantity of evaporation that would take place in calm air; hence it follows that frequently unusual heats or colds come on at unexpected times, and that the higher strata of the atmosphere are often warmer than the lower; for the heat of the atmosphere is derived not from the immediate action of the sun's rays which pass through it, but from the warmer and more solid bodies with which it has been, or is, in actual contact. In consequence of these various circumstances, it has been observed that the north Pacific Ocean, above latitude 40°, is much colder than the north Atlantic, between the same parallels of latitude. The interior parts of Siberia, call of longitude 100°, are much colder than the parts equally distant from the meridian on the western side. The coast and interior parts of the western regions of America are much colder above the latitude of 40°, than the corresponding tracts of the continent of Europe. Large seas, which are agitated by winds and currents; and thereby so little affected by cold winters or hot summers, as to prefer a temperature nearly uniform in every season, like the internal parts of the earth.

With respect to the mean temperature of places at different altitudes above the level of the sea, in the same country, or nearly about the same spot with respect to latitude, the heat diminishes nearly one degree of Fahrenheit for every 200 feet of elevation, according to Dr. Black. Other writers find reasons to assert, that the diminution of one degree takes place at every 290 feet of elevation.

From the statement of all the above, particularly the reader may form some idea of the time and place of natural congelation, may be expected, and he will at the same time be able to perceive that close to the surface of the earth, no great regularity can be expected. On the continent of Europe congelation formerly took place at a lower latitude than it does at present, when natural congelation is seldom observed lower than the latitude of 40°. In America congelation has been observed at a much lower degree; and it is remarkable that great degrees of heat, as well as great degrees of cold, are alternately experienced on the same spot of that continent. In the more northern parts of the world the degrees of cold are very extraordinary. At Tornaco, Reaumur's spirit thermometer fell to minus 34°. In Siberia the spirit thermometer has been known to descend as low as minus 121°. Even at the Glasgow observatory in the year 1780, the mercury of the thermometer exposed to the ambient air was found to stand at minus 14°.

The altitude on the sides of mountains, at which constant congelation takes place, seems to be less fluctuating, though not accurately ascertained. This altitude varies with the latitude; but even in the torrid zone, it has been observed (according to Bouguer and others) at the altitude of about 1500 feet. This altitude, at which the congelation is constant, or where water ceases to be a fluid; and beyond which visible vapour does not seem to ascend, is called the upper line of congelation. The lower line of congelation is where it freezes at night only. The upper line of congelation, within the tropics, has been observed at the altitude of 15000. Near the tropics, on the sides of the temperate zones, it lies at the height of about 15428 feet. On the island of Tenerife, lat. 25° 25' N., it lies at the altitude of about 10000 feet. In Avergne, lat. 43° N., the line of congelation is at the altitude of 6740 feet. In latitude between 51° and 54° N. it seems to be at the altitude of about 5800. In latitude 80° north, lord Mulgrave found the line of congelation at the altitude of about 12000 feet above the level of the sea; whence, if the progress of cold continues uniformly, as general Roy observes, we may conclude that the surface of the earth, at the pole itself, is forever covered with congelation. Mr. Kirwan, however, places the upper line of congelation considerably higher. See his paper on the variations of the atmosphere, in the 8th vol. of the Trans. of the Royal
CONGER, or Conger Eel, in Ichthyology, the largest of the Murcena tribe. This voracious fish grows to the length of five or six feet, and the thickness of a man's thigh. The colour of the upper part is dark grey, sometimes inclining to olive, and the belly pure white; but it is principally distinguished from the other species of the murcena genus by having the lower jaw rather shorter than the upper; nose with two tentacula, and the lateral line whitish, with a row of spots. See Murcena.

CONGERIES, a Latin word, sometimes used in our language for a collection or heap of several particles, or bodies, united into one mass or aggregate.

CONGERIES, in Aetiology. See SYNARTHROSIUS.

CONGESTION, in Medicine, has been used to denote an enlargement of any part of the body, especially when accompanied with hardness, or alteration of structure, which, in the opinion of the humoral pathologists, was produced by a collection of morbid humours, deposited in the part. The term is still employed, chiefly to express the morbid increase of distention in the blood-vessels in inflamed parts, or morbid effusions of blood or lymph in the viscera. Thus, a congestion of blood in the vessels of the brain is said to have produced apoplexy, when, on distention, vessels which are usually invisible, are observed to be filled with red blood; and congestion is said to exist in the lungs, when the circulation of the blood through the minute ramifications of the blood-vessels is impeded, or when lymph is poured out into the cells of the bronchiae, as in the catarrhus fenalis, and p. rippenennum.

CONGHEE LAKES, in Geography, a lake of Thibet, which intervenes between the Mangavar lake, and the head of the river Saperon.

CONGIRUM, Congiary, among Medallists, a gift or native, represented on a medal.

The word comes from the Latin congius, because the first portions made to the people of Rome consisted of wine and oil, which were measured out to them in congii. The congiary was properly a present made by the emperors to the people of Rome. Those made to the folders were not called congiaries, but donancies.

The legend on medals representing congiaries, is congiarum, or liberalitas.

Tibersius gave a congiary of three hundred pieces of money to each citizen: Caligula twice gave three hundred fettarii a head. Nero, whose congiaries are the first that we find represented on medals, gave four hundred. The congiaries of Nerva had on the reverse five figures.

CONGIO, or Congie, Camillo, in Biography, was a delineator and engraver of considerable talents. He was born at Rome about 1604. Little is known of his life, except that he followed his profession at the place of his nativity, and at Florence. About the year 1650, he engraved several of the plates for the Galleria Futiiniana. Most of the twenty plates for Tasso's Jerusaleme, from the designs of B. Calcelli, are by Congio, as likewise several of the engravings in the fine work entitled Odes Barcerinse. Besides the above, we have many prints by him executed in a bold and firm manner, from the designs or pictures of Tempesta Lanzanco, Pomeraccio, and other masters, and from his own drawings. His plates are generally marked with two C's, the top of one joined to the bottom of the other; or in this manner: C.C.P. The F. standing for feet. Strutt. Huber, Manuel des Arts.

CONGITELLA, in Antiquity, half a congius.

CONGIUM, in Ancient Geography, a town of Spain, placed by Ptolemy in the Tarragonese territory; the country of the Vacceans, supposed to be the present Cebescon.

CONGIUS, an ancient Roman measure of capacity, or for things liquid, = 1 of a cubic old Roman foot, = 8 sextaries, = 157.137 cubic English inches, = 1.141 cubic English feet.

From the original standard of Vespasian extant at Rome, Greaves deduced the value of the Roman pound to be 5.56 Troy grains. See DEXARIUS. But Mr. Raper, in an excellent paper on this subject, has suggested several objections against the accuracy of this conclusion. Phil. Trans. vol. lxi. part ii. p. 456.

The congius has also been used in England, as appears by a charter of king Edmund in 946.

CONGLETON, in Geography, a small corporate town in Cheshire, England, is situated near the upper part of the river Dane, on the borders of Staffordshire, and governed by a mayor and six aldermen. It possesses two churches, both subject to the mother church of Albire, a village two miles distant. The town was formerly celebrated for the manufacture of tagged leather laces, called Congleton points; but the chief employment of the poor is now derived from a very capital silk mill erected on the river; and from a ribbon manufactory. In the church-yard of Albire are two ancient Roman monuments, ornamented with the insignia of knighthood; but the families whose memory they were intended to record are now unknown. Congleton is 163 miles N.W. from London; has a market on Saturdays.
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In the return under the late act the houses were estimated at 857; the inhabitants at 3861, of whom 1713 were males and 2148 females.

CONGLOBATE glands, in Anatomy, those glands whose substance is not divided, but firm, entire, and continued; and their surface smooth and uniform.

They are thus called, in opposition to conglutinate glands. Conglobate glands have each of them an artery which brings them blood, a vein which carries it back again, after the proper juice has been filtrated, and several excretory ducts.

Some of them have a cavity in the middle, with lymphatic vessels, which discharge themselves into a common reftervoir, or canal.

CONGLOBATE flowers, are those with globular heads.

CONGLOMERATE glands, are those which are composed of several little ones; or they are several glandulous bodies joined together under the same common membrane. See GLAND.

Such are the salivary glands, biliary glands, the pancreas, &c. which see under their proper articles.

The conglutinate glands, besides their arteries, veins, and nerves, are also furnished with an excretory vessel, ramified throughout their own substance; by means whereon they discharge the liquid they have filtraled into the ranx.

CONGLOMERATE flowers, are those which are irregularly crowded together.

CONGLOMERATION, in Mineralogy, is the term used to express confused mixtures or concretions of different mineral substances. Kirwan's Geol. Essays, p. 323 and 306.

CONGLOMULATION, the act of gluing, or adhering two bodies together, by the intervention of some third, whose parts are undisposed and tenacious, in the nature of a glue, glutin; from whence the word is formed.

In the animal economy, the parts of the body are so arranged as to be conglutinated by means of their natural consistence; by the help of bandages, as in several cases of surgery; or by the supply of viscid particles. In which last acceptation, conglutination differs little from accretion, or nutrition.

CONG-MOU-JING, in Geography, a town of China, in the province of Se-tuchuen; 42 miles N.W. of Hoc-hi.

CONGO, or KONGO, a name given to the country of Africa, otherwise called Lower Guinea, which see. It is commonly divided into Lowango, Angola, Benguela, and Congo Proper.

Congo, or Kongo, Proper, a kingdom of Africa, bounded on the north by the famous river Zair or the river of Congo, which divides it from that of Loango, on that side; on the south by that of Dando, which separates it from the kingdom of Angola; on the east by the kingdom of Funguno and Metamba, and the burnt mountains of the fun, those of crystal or salt-petre and silver, and by the rivers Verbele and Cualanda; and on the west by the Ethiopean sea, called the Sea of Congo. Its extent from N. to S. and from E. to W. has not been accurately ascertained; but according to the relation of John Anthony Cavazzi de Monte Cenro, a Capuchin missionary, the dominions of the kings of Congo were much extended towards the east and the south, before the introduction of the Christian religion; but since this event, many of the remote provinces in these directions have been subdued, so that Congo was reduced from above 600 leagues in circuit to less than one-half of that extent. Being situated under the torrid zone, it is subject to the excessive heats peculiar to that climate; however, they are considerably mitigated by winds and breezes, rains and confluent dews; as well as by the more equal length of days and nights. Their summer and winter, which compose their year, are divided into six ra-

CON. which they call mafluza, neafu, coundi, quitombo, qulifo, and quinbanga. The first commences with the month of October; which is the beginning of their spring, when the rains begin to fall; and they continue during the two, and sometimes the three, next months. The floods that are thus occasioned are commonly followed by a famine. Their second season begins about the end of January, which is followed by harvest and new sowing; their lands commonly yielding them two harvests. The third and fourth seasons are frequently followed towards the beginning of March, when the more gentle rains begin to fall and continue till the month of May; at which time the air is clear and dry, but occasional clouds burst forth into tremendous lightnings whereon the earth and trees of their verdure, till the next maffuza, or spring, restores their venal bloom. The Congofect divide the year into twelve lunar months, commencing like that of the Jews, in September. Their week consists of four days; three of which are appointed for labour, and the fourth for rest or religious exercises. The general indolence of the inhabitants prevents their deriving any substantial benefit from the fertility of their soil, which duly cultivated would yield a double, and sometimes a triple, crop yearly. But the negroes, averse from labour, spend their time in dancing, leaping, hunting, and shooting, or in smoking and more idle in
dolence; whilst they commit to their slaves, or their wives, the operations of digging, sowing, reaping, cutting woods, gridding corn, and fetching water. Their ground produces a variety of grain, but no gourd or rice bushes that is cultivated by the Portuguefe. Of their maife, of which they have regularly two crops, they make their bread. They have three other sorts of grain, which they apply to the same purpose. They also cultivate a variety of pulse, as beans and peas of different sorts, which serves them for part of their food. Their fruit-trees have been chiefly trees planted there by the Portuguefe; and of palm-trees, which are exotic and brought from America, they have no less than eight sorts, which are all excellent in their kind. If we may credit the accounts that are given of the productions of the country, which sometimes border on the fabulous, they have a tree called Aliconda, so large that ten men cannot fathom it, yielding a fruit which resembles a gourd, and which serves for vessels of various uses; the bark of which furnishes them with a coarse thread, which they form into ropes and into a cloth, with which the natives cover their middle from the girdle to the knees; and the small leaves of which supply them with food in a time of scarcity, while the large ones are used for covering their huts, or by burning for the manufaets of good foam. Of the bark of the infanta tree, and also of the mulemba, resembling in many respects our laurel, they form a kind of stuff or cloth, which is fine and used for cloaks and girdles by persons of the highest rank. The oil of their palm-trees is used instead of butter; with the moss that grows about the trunk, the rich commonly stuff their pillows; and the Gi-
gas apply it to their wounds with good effect; with the leaves the Moors cover their houses, and they draw from those trees, by incision, a pleasant liquor like wine, which however turns four in five or six days. From the Congo palm-tree, so called, because it thrives better in that country than any of the other sorts, they obtain a liquor, which is reckoned as valuable as the wine that is brought from Eu-

lope, though it is rather a kind of milk, sweet and agree-

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peeled in the melon, and it has been said that the Europeans only burn it in their lamps. Of their shrubs we shall only mention that which they call capano, or "the fig of hell," from the root of which they extract an oil for the lamp, and which they also use in the composition of theirointments and plasters. The leaves burnt to ashes, afford a good lye, with which the natives wash their bodies. The Portuguese have observed to plant few of these fruits, as oranges, lemons, citrons, granate, cedar, and others, which thrive as well as in their native soil. Vines have also been brought hither from Candia; and they yield excellent grapes twice a year. They have also plants of the aromatic kind, which yield substitutes for cinnamon and pepper. Their maio, of which they make bread, is the same which is used in Asia and America; their potatoes and other roots of a like kind yield a grateful nourishment. Wheat is the only grain which the ground will not produce, as it floats up into straw and ear, the former being high enough to hide a man on horseback, and the latter being unfilled. Their grains grows to a great height, and affords sheltering places for a variety of wild and voracious beasts, and venomous insects; so that it is dangerous to travel through the country on this account. Their lilies, tulips, tuberose, hacinths, &c., grow wild, and are singularly beautiful.

The principal rivers of this country are the Zair, into which fall the Bancaro, Vamba, Congo, and Barabela or Verac, the Dando, which see respectively. Between the Zair and Dando, are the Lechucos, Ambriz, Loez, Oaza, and Luilana, with several others of less note.

Congo is divided into fix large provinces, under the titles of duchies, counties, and marquises, and these again are subdivided into lesser fignitaries or lordships. The situation of these provinces is as follows: along the sea coast lie the counties of Songo, and the great duchy of Bamba; on the north, the duchy of Sandi, and the marquisate of Pango; on the west, the duchy of Batta; and within land, the marquisate of Pemba. See each respectively. The capital of the whole kingdom is Banza, or St. Salvador, which see.

Independent of the six districts above enumerated, Congo has several other lesser provinces, most of which are covered with forests or mountains, and inhabited by a race of men in a barbarous and savage state: their names, as we learn from Cuvazzi, are Zuins, Juzamasando, Nambu, Nifio, Nichtejua, Alombo, Nioi, Nzanga, Maranga, and Morenda; the three last of which border upon the country of Ajacan, a nation more barbarous than any of the rest.

The kingdom of Congo, like most other parts of Africa, breeds a prodigious variety of living creatures, both wild and tame, and particularly those of the former sort: such as elephant's and hens, of a monstrous size, leopards, tigers, wolves, and other voracious animals. The zebra of this country is a beautiful animal, which the natives hunt, on account of its flesh, which they esteem a dainty food, and for its hide which they sell to Europe as a valuable commodity. In this country they have also a great abundance of buffaloes and wild asse. The "Dante" seems peculiar to this country; in shape and colour it resembles an ox, but is not so large; its horns are like those of a hog, but very smooth and shining, and of a blackish hue, of which the natives make a variety of pretty bangles; the skin is commonly bought by the Portuguese, and sent into Germany, to be tanned and made into targets, called "Dantes;" and of the raw hide dried, the natives make their shields, which are impenetrable to arrows and darts, and so large as to cover the whole body. Camelions swarm in Congo, and it has several forts of wild rats, as the nongi, niffo, and maimont, whose fur excels those of the fuch tygers, in the beauty, variety, and regularity of their breaks and spots. The fores also swarm with wild dogs, which are extremely fierce and voracious. It has also one singular quadruped, which abides constantly in the trees, and which is laid to die immediately upon setting its feet on the ground; it is called "cutting," and is very small; its fur is so beautifully spotted, that none but the kings of Congo, the princes of the blood, and such nobles as obtain the privilege from him, have the liberty of wearing it. And even the kings of Lovango, Cacango, and Gay, receive this extraordinary fur, as a valuable present.

The tame animals of Congo, such as oxen, sheep, horses, mules, and asses, which might be rendered useful and profitable, are much neglected. The Portuguese, however, have directed their attention to the cows, sheep, and goats, chiefly on account of their milk, though they have not learned to make butter or cheese. The land and sea fowls of this country are very numerous; its oifriches are very large and beautiful; the feathers of which, mixed with those of peacocks, do not los numerous and beautiful, are used, instead of ensigns and standards, and made into umbrellas. Turkeys, geese, hens, and ducks, both wild and tame, and also peafants, pigeons, doves, woodcocks, and other smaller birds, abound in this country. Of parrots there is a great variety, distinguished both by their fize and colour; the most esteemed of these are such as they denominate, by way of excellence, the birds of night, which are kept by persons of rank in cages and aviaries, for the sake of their surprising melody. Here are other birds which the superstitious natives regard with horror; the flight or cry of which throws them into a general panic, and occasions them to disperse with the utmost precipitance and confusion. The most dreaded of the ominous kind are crows, ravens, bats, owls, and especially the great owl, which they call, in their language, "karim pemba," the name they give to the devil. Birds of prey, such as eagles, vultures, falcons of various sorts, sparrow-hawks, and others of a similar kind, are found in great numbers. Herons, bitterns, and some others of the like voracious kind, commonly abound in their marshes, lakes, and other waters. Amongst these they have a bird, in shape and fize like a crane, and one in particular, called by the Portuguese the pelican, of a large size and white, or colour; and also another called the fisher, which dart from a surprizing height in the air on the fish which he perceives in the sea or on rivers. Of fish, the sea adjoining to this country, and its rivers, afford great plenty and variety. The inhabitants are likewise infested with a great variety of serpents, very long and thick, rattle-snakes, vipers, and other venomous reptiles, scorpions, and other venomous insects, both flying and reptile, of various kinds, are found in this country. This country is fated to possess mines of silver and gold, as well as of iron and copper; but the people are too indolent to work them, or to derive any great advantage from them.

When the Portuguese first discovered this country, in the reign of John II., in the year 1484, they found it for the most part covered with towns and villages, swarming with inhabitants; the cities being well filled with people, and particularly the metropolis, which contained above 50,000 persons. We may form some judgment of the population of the country by this circumstance, viz. that the army of the king of Congo, in the year 1665, consisted of no less than
than 500,000 fighting men; and, besides, the number of converts to Christianity, which a small number of Capuchin friars made among the more civilized fort, within the space of a few years, is affirmed to have amounted to 6,000.

The surprising fecundity of their women, the hardship with which they bring up their children, and the robust healthy constitution of their men, if we may credit Cuvier, and the renown of their villages and hamlets to swarm with men, women, and children that a father will exchange one or two of the latter for some commodity he wants, or even some trifling balhie which he facts—ip information that the number of slaves they fell abroad, both by sale, communius annis, fall short of 15 or 16 thousand. Notwithstanding the indolence and consequent poverty of the Congolese, they entertain the most extravagant conceits both of themselves and of their country; so that it is one of the articles of their belief, that the rest of the world was the work of angels, but that their kingdom of Congo, in its full and ancient extent, was the immediate production of the Supreme Architect himself, and most of course enjoy singular advantages and prerogatives above all others; and that their monarchs must be the most opulent, wise, and powerful, and their subjects the noblest, richest, most ingenious, and happiest in the universe. They imagine also, that the natives who traffic with them are forced to undertake that servile employment by their poverty and the fertility of their respective countries, rather than induced to it by their luxury and avarice; whilst they themselves, with the utmost ease and content, can indulge their natural indolence, though attended with hunger and misery, rather than dispensing the nobleness of their blood by any kind of industry; which, however laudable and beneficial, is regarded by them as a lesser degree of labour. However, since the settlement of the Portuguese, they have been routed by their example from this kind of fantastic pride and thraldom flotilo into occasional and partial exertion; in weaving nets, and other coarse stuffs, sawing of boards, several branches of carpentry, and other manufactures and trades. But though they think it beneath their dignity to apply to any useful work, they deem it no disgrace to beg and steal.

The complexion of the genuine natives, that both of the men and women, is black, but some of them are of a deeper dye than others. Since their intermarriages with the Portuguese, they have varied from their native hue; some to a dark brown, some to an olive, and others to a blackish red. Their hair is black and curled, and in some cafes of a dark sandy; their eyes are generally of a fine lively black, but some are of a dark sea-colour; they have neither flat noses nor thick lips, like the Nubians and other negroes; their nature is moily of the middle size; and, excepting their black complexion, they much resemble the Portuguese, though none of them are more fat and flabby. In their disposition, they are generally mittrfully, jealous, envious, and treacherous, and much inclined to revenge. They are so far devoid of natural affection, that a father will sell his son or daughter, and perhaps both, for a piece of cloth, a collar or girdle of coral or beads, and often for a bottle of wine or brandy. A husband may have as many wives, or if a Christian, as many concubines, as he pleases, and repudiate, or even kill them, though with child, at his pleasure. The religion of the country, before the Portuguese introduced their Christianity into it, was, and still is, among the unconverted, a monstrous compound of idolatry and superstition, and of the most absurd and detestable rites and customs, invented by their "gangas," or priests, for the purpose of keeping the people in a state of the most abject subsjection, and cruel tyranny and wretchedness. They do, indeed, acknowledge one supreme being, called "Nzambimpong," believed to be all-powerful, and to whom they ascribe the creation of their country; but they suppose that he has committed the care and government of all subhuman things to great variety of subordinate or inferior deities, appointed to preside over the air, sea, and earth; lakes and rivers, winds and storms, rain, lightening, drought, heat and cold, men, beasts, fruits, and fruits, trees, fruit, and other productions of nature, and made them healthy and sickly as he pleased. Hence proceeds that momentous mixture of white deities, idols and stars, and that prodigious variety of gangas or priests, and superstitious rites, still found in those parts of the kingdom, where Christianity has not been introduced. These imaginary deities are represented under various forms, at the pleasure of the worshipper, either of living creatures, as serpents, crocodiles, lions, tigers, he-goats, &c. or of trees and plants of different kinds, or of statues and images, skilfully carved or painted, some of which they worship in their houses, and others in temples of mean construction. Their worship consists in genuflections, prostrations, fummoniations, and other such superstitious rites; and also, agreeably to the injunctions of the gangas, in offerings of their most valuable effects, for food, apparel, &c., from which the principal revenue of the gangas is derived, who contrive to sell the favour of these deities at the most exorbitant price. Such is the superlition of the people, and the unbounded influence of these gangas, that they will not attempt to build a house or hut without consulting some ganga, and putting the edifice under the protection of a deity; nor can the owner take possession of it without employing the gangas to make the necessary sacrifices and fummoniations, and performing other ceremonies, in order to secure that protection. Even the gangas, who are the most barbarous people of this kingdom, never venture to begin their harvet till they have offered various, and even human victims to their gods, and gorged their gangas themselves with human flesh. Excepting their new moons, they have no fest festivals or fasts of worship, besides those which the president of the gangas appoints, after a victory, a good harvest, &c. to whom it belongs, to appoint the attendant sacrifices and rites, to receive the offerings of the people, and to prescribe the various ceremonies which accompany them. The highest power and dignity, pertaining to the priestly tribe, are those which are vested in the "halome" or "chalome," whom the people revere as a kind of deity, and to whom whole rank and office various privileges belong. The influence of the gangas is so extensive and so powerful, that the kings of Congo, though devious of extirpating idolatry from their dominions, have been unable to effect it. With regard to the establishment of Christianity in the kingdom of Congo, the first preachers commissioned by the court of Portugal for this purpose, were priests and monks of the church of Rome; so that the Roman religion became the established religion of all the conquered provinces of the kingdom. But Christianity, even under that form of it, has been so much neglected, that in the greater part of these extensive dominions, nothing now remains but the mere name of Christian. It is said, indeed, that the catholics in the duchy of Sogno, are better Christians than others, as they pay a peculiar regard to the external forms of the popish worship. The princes of this province, as well as those of Bamba and Temba, have always distinguished themselves by their zeal for the Christian religion, under that external mode of it in which they have been instructed; and they have been careful to preserve their respective governments from being corrupted by the heathenish gangas or priests;
prides; and if any such are ever found within their dominions, they are treated with a severity, which prevents their attempting to repeat their visits.

The government of Congo is monarchical and despotic. The kings are the sole proprietors of all the lands within their dominions; which they parcel out to individuals on condition of a certain tribute and of the performance of particular services. The tribute is ordered to be brought in once in three years at the feast day; and the rigorous demand of it is the cause of many cruel extortions, which often terminate in a revolt, or open rebellion. The crown is partly hereditary, and partly elective, for that no candidate can be chosen, unless he be of the royal blood; and since the introduction of Christianity, a Christian of the church of Rome. The whole process of his coronation and his mode of living after his advancement to the throne are attended with various circumstances of splendour and magnificence. Whenever he goes abroad, which is seldom the case, he is attended by a numerous guard, confiding of Anfiki (See Ando), and some others of neighbouring nations in whom he reposes the greatest confidence, musicians, knights of the holy crosses, (an order instituted by the first Christian king of Congo) and a number of officers, richly accoutred. The respect that is paid him approaches idolatry. His court is numerous and brilliant; and the royal palace is spacious, grand, and commodious. His feragho, in which he keeps a great number of concubines, though he is allowed only one wife, is a kind of prison; as the women that enter it are confined during the remainder of their lives. His lawful wife prefides in the feragho over all the other women; who indulge themselves in the most licentious gratifications. The royal revenue consists chiefly in the tribute that is paid him by several vassal princes; free-will offerings, in acknowledgment of the lands which are held under him; the property of all the zimbis, or cockle-bells, that constitute the current coin of this and other neighbouring kingdoms; mines of silver and gold, which, however, are much neglected; and the renewal of fees and intemperance, fines and confiscations. He has also the prerogative of levying taxes upon his subjects whenever he pleases. His flinding forces are neither numerous, nor well-disciplined, and very badly armed and clothed. Their mode of fighting is tumultuous and ferocious, nor do they give any quarter. Those that are taken alive are hurried to the sea-side, or to some inland market, where they are sold for slaves to the Europeans. The funeral obsequies of the monarchs of Congo before they were converted to Christianity, consisted of various kinds of sacrifices and superstitious ceremonies, accompanied with music, howling, dancing, and feasting, which lasted a whole week, and were resumed once a year, on the anniversary of the king's demise. It was also the custom to bury alive a certain number, nor exceeding twelve, of his favourite concubines, or young ladies belonging to his court; but Christianity has abolished this inhuman custom, though it has not suppressed the drunken revels that take place on this occasion.

It is considered as a great crime and liable to punishment on conviction to shed tears even for the king. But certain persons are kept in pay to go to all the public places of the city or town, to remind the subjects of his death by the mournful sound of their ivory cornets. The princes and nobles are interred in wainscotted vaults hung with black; and two of their old domestics defined absolutely to guard the entrance, and to pray for the deceased. Other prayers are to be offered on the anniversary of their decease, and on All-hallows day, at which times their graves are opened, and the hangings exchanged for new ones. The gaggas dance about the graves of the deceased in a frantic manner, and bring them viuets, drink, and other conveniences. The dances that are performed at the funeral of their great men last eight whole days, without intermission: and upon these occasions, they never fail sacrificing a number of human victims, the flesh of which they devour with peculiar relish. Mourners of the common class shrow their whole heads, and anoint themselves with oil, upon which they rub such a quantity of earth and dust, and dried leaves, as to give them a shocking appearance. Thieves of higher ranks shave only the upper part of their heads and bind it with a lint of cloth, linen, or leather, and confine themselves to the outside for eight whole days. The Congolese conceive concerning dying persons that they are just passing from a wretched life into a state of tranquillity and happiness; and therefore they think they cannot act a kinder part than to accelerate their deliverance. Among the vulgar this notion leads to the barbarous practice of flapping the mouth and nose of a dying person, and thumping upon the breast with violence, that he may the sooner pass into a state of felicity.

The Congolese have no written laws; but custom and tradition serve them instead of a code and commentaries, unless favour or bribery interpose. Every province has a chief justice for civil and criminal affairs from whom an appeal may be made to the king; and under him are inferior officers in every town and community. Three offences, viz.: treason, murder, and forcery, are deemed capital; and the two first are punished with decollation, and the latter by being burned alive. The punishments of lesser offences are the batonade, hanging, fines, and imprisonment.

The traffic of the Congolese with the Europeans consists chiefly in slaves, and St. Salvador is the principal mart of the country. The traders who reside in this place bring thither the products of Brazil, such as grain, fruit, plants, and other provisions, and the manufactures of Europe, which are usually Turkey carpets, English cloth, and other fluffs; copper and brass vessels, blue earthen ware, rings, and ornaments of gold, silver, and base metals, coral, glass beads, bugles, and other trinkets; tobacco, wine, brandy, and other spirituous liquors; light fluffs made of cotton, linen, and woollen, for clothing; and a great variety of tools and utensils. In return they carry off a number of slaves, amounting annually to 15 or 16,000. Slaves indeed are employed at home in all their laborious occupations, and are reckoned the most valuable commodities, which a man possesses or is able to bequeath to his children or relations. Among the Congolese every kind of manufacture is in a very imperfect state. The roads through different parts indicate the inattention and indolence both of the government and the people, as they are either extremely bad in themselves or infested with banditti, and a variety of pernicious animals.

The houses of the Congolese are low, ill-built huts, thatched with straw or fern, without windows and with doors so low, that the shortest man is obliged to stoop when he enters them. They are so lightly built, as to be liable to be blown away by a gust of wind. Thieves, however, belonging to the Portuguese are built of brick and mortar, and generally well-furnished and adorned. The furniture of the Congolese houses consists chiefly of some few ill-strung instruments for agriculture, a hatchet to fell timber, a cutlass for travelling or for war, some few calabashes for containing their provisions, a pot, kettle, and ladle, a few earthen platters, and a hand-mill for grinding their corn. Their bed bedding is a large coarse sackcloth, filled with straw or leaves, with a slight covering, and perhaps a log of wood instead of a pillow. But the Portuguese have introduced
introduced among the superior classes, and particularly in the palaces of the princes and viceroys, various articles of luxury.

Polygamy was universally allowed in Congo before the introduction of Christianity; and since that period, the millionaires have in vain endeavoured to persuade the inhabitants to be contented, each of them, with one wife. Previous to marriage the perfom is allowed three years trial; and when this term is expired, the priest performs the ceremony, and the stipulated dowry is paid. This ceremony is preceded by a sumptuous banquet, and dancing and drinking are continued till the next morning, when the parties retire.

The martial instruments, now used by the Congolese, are such as the Portuguese have introduced; such as the trumpet, cornet, French-horn, and fife; but the common people are contented with their flits and tabors at their weddings and other rejoicings. They have also stringed instruments, which by their rude construction seem to be natives of the country; of which are their "nfambi," resembling the Spanish guitar, and the "mambo," consisting of fifteen or sixteen small calabashes, of different sizes, fastened to a flat board by strings that pass across their mouths, and which, being touched by small pieces of wood, like the ducks of ourvilicers, yield an agreeable variety of sounds. Their drums are made of a long hollow trunk of a tree, with a single skin stretched over one end of it, the other being left open; they are beat either with the fist, or by sticks of heavy wood, and are used at their festivals as well as in the army; they are called "ngambo" or "ingambo," and give but a dull heavy sound, which is raised either by that of the fist, or the "longa," which consists of two or more small bells. The dancing of the Congolese consists in a promiscuous round of men and women, all dancing who shall have the greatest agility and variety of gambols, contortions, and indecent postures.

The history of the foundation of the monarchy of Congo is uncertain and fabulous. It is ascribed to the son of a neighbouring prince, whose small territory was situated on the banks of the Zair, a language of the whole province of Npemlacaffi, since called Congo, and extended his conquests from the mouth of the Zair to the city of St. Salvador. His successors, it is said, have maintained themselves on the throne ever since his time. This country was discovered by the Portuguese in the reign of king John I., who employed Diego Cam, a person of enterprise and a famous navigator, in an expedition for making discoveries on the coasts of Ethiopia. Cam, on his arrival near these coasts in the year 1455, fell inadvertently upon the rapid stream of the river Zair, as he was endeavouring to double the cape Catalina; and having cast anchor at its mouth, he explored the country situated on its banks, and was well received by the inhabitants, who conducted four or five of his officers to St. Salvador. Before their return, he determined to set sail for Portugal, and took with him four of the natives. King John was so pleased with the account which he received of the country, that he ordered Cam to return with his companions as speedily as possible, and furnished him with valuable presents for the king and his court. He charged him, moreover, to exhort the monarch of Congo, in his name, to become a convert to the worship of the only true God, and to permit the Christian religion to be propagated through his dominions. Cam, in the year 1,457, arrived at Congo, and was very favourably received. No time was lost in establishing an alliance between the two crowns of Portugal and Congo, which has continued to subsist, though often suspended by intervening wars. This alliance was followed by the conversion of the king to the Christian faith. For a further account of the hereditary sovereigns of Congo, too minute in detail to be introduced into our work, we refer to the "Modern Universal History," vol. xii.

Congo money, or Guinea money, a name given to a peculiar species of coinage of copper, or porcelain tiles, which pass by way of money among the natives of those places. It is distinguished from the other porcelains by having a dentated mouth, and five gibbous protruberances on its surface.

Congo, or Guinea, a town of Pería, in the province of Irak; 75 miles N.N.E. of Amadan.

Congo, or Guinea, a town of Pería, situated on the eastern side of the Perían Gulf. N. lat. 25° E. long. 52°.

Congratulation, denotes the immediate expression of our joy, on account of any favourable event that has occurred in any of our connections.

Congregation, an assembly of several ecclesiastics, united for to constitute a body.

The term is principally used for assemblies of cardinals, appointed by the pope, and distributed into several chambers, for the discharge of certain functions and jurisdictions, after the manner of our offices and courts. The decisions of these societies are generally sanctioned by the approbation of the Roman pontiff, who has not a right, without alleging the most weighty and evident reasons, to reverse what they pronounce to be just and expedient. This form of ecclesiastical government is, without doubt, a check to the authority of the pope; and hence it is, that many things are transacted at Rome in a manner that is in direct opposition to the sentiments of its spiritual ruler. This may serve to correct a mistaken notion concerning the nature and limits of the papal hierarchy maintained by thfe, who pretend, that all the iniquitous proceedings of the court of Rome, the calamities it has occasioned, the contentions, rebellions, and tumults it has excited, are to be wholly laid to the charge of the Roman pontiff. Hence it also arises that important dilhension that has been frequently employed by the ecclesiastics and other nations in their debates with the Roman pontiff, that is, the distinction between the pope of Rome, and the court of Rome. The one is often loaded with the bitterest reproaches and the heaviest accusations, while the other is spared, and in some measure excused. Nor is this distinction by any means groundless; since the cardinals and congregations, whose rights and privileges are held sacred, undertake and execute many projects without the knowledge, and sometimes against the will and confederacy of the Roman pontiff.

The principal congregations of cardinals are these:

1. "The Congregation of the Pope," instituted first by Sixtus V., to prepare the matters that were to be brought before the conclave, at which the pope is always present. Hence this is called the "colloquial congregation," and in it are treated all affairs relative to the creation of bishops and cathedral churches, the reunion or suppression of episcopal sees, the alienation of church goods, and the taxes and annates that are imposed upon all benefices in the pope's gift. The cardinal-dean presides in this assembly.

2. "The Congregation of the Inquisition," or, as it is otherwise called, "of the holy office," instituted by Paul III., or, as others say, by Pius IV., and reformed by Pius VI., which takes cognizance of heretics, apostates, magic, and profane writings.
ings, assembling thrice in the week, and every Thursday in presence of the pope, who presides in it. This congregation consists of at least 12 cardinals, with several other prelates and divines of different orders, who were called consultors of the holy office. The office of grand inquisitor, which encroached upon the prerogatives of the pontif, has been long suppreffed, or rather distributed among the cardinals who belong to this congregation, and whose decisions are understood with the supreme cognizance of his holiness. See 

**Inquisition.** 2. "The congregation for the propagation of the Roman Catholic faith," founded under the pontificate of Gregory XV., and composed, (fays the translator of Moffen's Eccil. Hist.,) of 18 cardinals, one of the secretaries of state, a protonotary, a secretary of the inquisition, and other inferior members. (See *College de propaganda fide*.)

In this congregation are carried on the deliberations which relate to the extirpation of heresy, the appointment of missionaries, &c.; this congregation has built a most beautiful and magnificent palace in one of the most agreeable situations that could be chosen at Rome, where professors to popery from foreign countries are lodged and maintained gratis in a mansion suitable to their rank and condition, and instructed in those branches of knowledge to which their genius inclines. The prelates, vicars, and curates, who are obliged, without any fault on their own part, to abandon the places of their residence, are entertained charitably in this noble edifice, in a manner corresponding to their rank in the church. 4. "The congregation designed to explain the decisions of the council of Trent." 5. "The congregation of the Index," whose principal business is to examine MSS. and books that are designed for publication, to decide whether the people may be permitted to read them, to correct those books whose errors are numerous, and which contain nefulous and subversive truths, to condemn those whose principles are heretical and pernicious, and to grant the peculiar privilege of publishing heretical books to certain persons. This congregation, which is sometimes held in the presence of the pope, but generally in the palace of the cardinal-prefident, has a more extensive jurisdiction than that of the inquisition, as it not only takes cognizance of those books that contain doctrines contrary to the Roman Catholic faith, but of those also that concern the duties of morality, the discipline of the church, and the interests of society. Its name is derived from the alphabetical tables, or indexes, of heretical books and authors, which have been compiled by its appointment. 6. "The congregation for maintaining the rights and immunities of the clergy, and of the knights of Malta." This congregation was formed by Urban VIII., to decide the disputes and remove the difficulties and inconveniences that arose from the trials of ecclesiastics before princes, or other lay judges. 7. "The congregation relating to the Bishops and regular clergy," established by Sixtus V., to decide the disputes and remove the difficulties that arose between the bishops and their dioceses, and to compose the differences that happened to be frequently among the Monastic orders. 8. "The congregation," appointed by Gregory X IV., for examining into the capacity and learning of the bishops. 9. "Another," for inquiring into their lives and morals. 10. "A third," for obliging them to reside in their dioceses, or to dispense with that obligation. 11. "The congregation for suppressing monasteries," i.e. such whose revenues are exhausted, and which therefore become a charge upon the public. 12. "The congregation of the Apolitic Veneration," which names the visitors who perform the duties and visitations of the churches and convents within the jurisdiction of Rome, to which the pope is obliged, as archbishop of that city. 13. "The congregation of Relics,"

designed to examine the marks, and to augment the number of those instruments of superstition. 14. "The congregation of Indulgences," designed to examine the case of those who have recourse to this method of quiting the confessions. 15. "The congregation of Rites," appointed by Sixtus V., to regulate and invent the religious ceremonies that are to be observed in the worship of each new saint that is added to the calendar. Such are the congregations of cardinals, set apart for administering the spiritual affairs of the church; and they are undeniably, in some respects, a check upon the power of the pontif, enormous as it may be. There are few men, which relate to the temporal government of the papal territories. In these congregations, where the pope is never present, all things are transacted which relate to the execution of public justice in civil or criminal matters, the levying of taxes, the providing of good governors for the cities and provinces, the relief of those who are unjustly oppressed by subordinate magistrates, the coinage, the care of the rivers, aqueducts, bridges, roads, churches, and public edifices.

**Congregation** is also used for a company or society of religious cantoned out of this or that order; and making, as it were, an inferior order, or a subdivision of the order itself. Such are the congregations of the Oratory, and those of Cluny, &c., among the Benedictines.

The word is also used for assemblies of pious persons, in manner of fraternities; frequent among the Jesuits in honour of the Virgin, &c.

**Congregation of Aids, or de Auxiliius,** was established in consequence of a dispute between the Dominicans and Jesuits. The former had long cherished a deep rooted and invincible hatred against the latter; and having a favourable opportunity of venting their indignation, exhausted their furious zeal against the doctrine of Molinus, notwithstanding the public edict, issued by Clement VIII., in the year 1594. They incessantly wrested the Spanish monach, Philip II., and the Roman pontiff, Clement VIII., with their importunate clamours, till at length the latter found himself under a necessity of assembling at Rome a fort of council for the decision of this controversy. Thus commenced, about the year 1598, those famous deliberations concerning the contest of the Jesuits and Dominicans, which were held in the congregation of aids. This congregation was afterwards held at Rome in the year 1610, and was attended by the most eminent prelates. The history and transactions of this congregation are related and illustrated by several writers of different compositions, by Jesuits, Dominicans, and Jesuits. After all it is still a matter of doubt, which party was most favoured by the court of Rome on this occasion, the Jesuits or the Dominicans, and which of these two parties defended their cause with the greatest dexterity and success.

**Congregation of the Immaculate Conception.** See Immaculate.

**Congregation of the Lateran.** See Lateran.

**Congregation of the Lord, in Ecclesiastical History, an association of reformers in Scotland, formed in the year 1557 by the earl of Argyle, his son lord Lorne, the earl of Morton and Glencarne, Erskine of Dun, and others, who, observing the danger to which they were exposed, and desirous of propagating their principles, entered privately into a bond or association; and assumed this appellative.
CONGREGATIONALISTS. See INDEPENDENTS.

CONGRESS, CONGRESSUS, is used for an assembly of commissioners, deputies, envoys, &c. from several courts or provinces, meeting to settle terms for a general pacification or to concert measures for their common good.

The congress at the Hague, while held during the course of the war, terminated in 1697, by the treaty of Ryfwick, was composed of the envoys of all the princes in the confederacy against France.

CONGRESS, in Modern History, denotes that body, in which, by the constitution of the United States of America, all legislative powers are vested. It consists of a senate and house of representatives. The house of representatives is composed of members chosen every second year by the people of the several states; and the electors in each state shall have the qualifications requisite for electors of the most numerous branch of the state legislature. No person shall be a representative under the age of 25 years, who has not been seven years a citizen of the United States, and who, shall not, when elected, be an inhabitant of the state in which he shall be chosen. The number of representatives, apportioned among the several states, which may be included within this union, according to their respective numbers, to be ascertained by actual enumeration within three years after the first meeting of congress, and within every subsequent term of ten years, shall not exceed one for every thirty thousand; but each state shall have at least one representative. In case of vacancy in the representation of any state, writs shall be issued by the executive authority for filling such vacancies. The house of representatives chuse their speaker, and other officers, and have the sole power of impeachment.

The senate of the United States is composed of two senators from each state, chosen by its legislature for six years; and each senator has one vote. The senators are divided into three classes; the seats of those of the first class being vacated at the expiration of the second year; of the second class at the expiration of the fourth year; and of the third class at the expiration of the fifth year; so that one-third may be chosen every second year.

No person shall be a senator, under the age of 30 years; after being nine years a citizen of the United States, and who is not, when elected, an inhabitant of the state for which he is chosen. The vice-president of the United States is president of the Senate, but has no vote, unless the votes be equally divided. The Senate chuses its other officers, and also a president pro tempore, in the absence of the vice-president, or when he shall exercise the office of president of the United States. The Senate has the sole power to try all impeachments; and no person shall be convid without the concurrence of two-thirds of the members present.

The Congress shall assemble at least once in every year, and such meeting shall be on the first Monday in December, unless they shall, by law, appoint a different day. Each house has its peculiar powers; but neither house, during the session of congress, shall, without the consent of the other, adjourn for more than three days, nor to any other place than that in which the two houses shall be sitting. The senators and representatives shall receive a compensation for their services, fairest by law, and payable out of the treasury of the United States. They are, in all cases, except treason, felony, and breach of the peace, privileged from arrest during their attendance at the session of their respective houses, and in going to, and returning from, them; and for any speech or debate in either house, they are not to be questioned in any other place. No senator or representative shall, during the time for which he was elected, be appointed to any civil office under the authority of the United States, which shall have been created, or the emoluments of which shall have been increased, during such time; and no person holding any office under the United States shall be a member of either house, during his continuance in office.

All bills for raising revenue shall originate in the house of representatives; but the senate may propose or concur with amendments, as on other bills. Every bill, which shall have passed the house of representatives, and the senate, shall, before it become a law, be presented to the president of the United States; if he approves, he shall sign it; but if not, he shall return it, with his objections, to that house in which it has originated, who, having entered the objections on their journal, shall proceed to reconsider it. If, after reconsideration, two-thirds of that house shall agree to pass
the bill, it shall be sent, together with the objections, to the other house, by which it shall likewise be reconsidered, and, if approved by two thirds of that house, it shall become a law. In such case the votes of both houses shall be determined by yeas and nays, and the names of the persons voting for and against the bill shall be entered on the journal of each house, respectively. If any bill shall not be returned by the president within ten days (Sundays excepted) after it has been presented to him, the same shall be a law, as if he had signed it, unless the congress, by their adjournment, prevent its return, in which case it shall not be a law. Every order, resolution, or vote, to which the concurrence of the senate and house of representatives may be necessary, shall be subject to the same rules and limitations as are prescribed in the case of a bill.

By the constitution the congress shall have power—to lay and collect taxes, duties, imposts, and excises—to pay the debts and provide for the common defence and general welfare of the United States—to borrow money on the credit of the United States—to regulate commerce with foreign nations, among the several states, and with the Indian tribes—to establish an uniform rule of naturalization, and uniform laws on the subject of bankruptcies, throughout the United States—to coin money, regulate its value, and that of foreign coin, and to fix the standard of weights and measures—to provide for the punishment of counterfeiting the securities and current coin of the United States—to establish post offices and post-roads—to promote the progress of science and useful arts, by securing for limited times to authors and inventors, the exclusive right to their respective writings and discoveries—to constitute tribunals inferior to the supreme court—to define and punish piracies and felonies committed on the high seas, and offenses against the law of nations—to declare war, grant letters of marque and reprisal, and make rules concerning captures on sea and land—to raise and support armies, but without appropriating money to that use for a longer term than two years—to provide and maintain a navy—to make rules for the government and regulation of the land and naval forces—to provide for calling forth the militia to execute the laws of the Union, suppress insurrections, and repel invasions—to provide for organizing, arming, and disciplining the militia, &c. referring to the states, respectively, the appointment of the officers, and the authority of training the militia, according to the discipline prescribed by congress—to exercise exclusive legislative, judicial and executive power over such districts, (not exceeding ten miles square) as may, by cession of particular states, and the acceptance of congress, become the seat of the government of the United States, and to exercise like authority over all places, purchased by consent of the legislature of the state in which the same shall be, for the erection of forts, magazines, arsenals, dock yards, and other needful buildings—and to make all laws which shall be necessary and proper for carrying into execution the foregoing powers, and all other powers vested by this constitution in the government of the United States, or in any department or officer thereof.

The powers of congress, however, are subject to certain limitations; e.g. the privilege of the writ of habeas corpus shall not be suspended, unless the public safety requires it in cases of rebellion or invasion. No bill of attainder, or ex post facto law, shall be passed. No exaction, or other direct tax, shall be levied, unless in proportion to the census, or enumeration, herein before directed to be taken. No tax or duty shall be laid on articles exported from any state; no preference shall be given by any regulation of commerce or revenue, to the ports of one state over those of another—no shall vessels bound to or from one state be obliged to enter, clear, or pay duties, in another—no money shall be drawn from the treasury, but in conformance of appropriations made by law; and a regular statement and account of the receipts and expenditures of all public money shall be published from time to time. No title of nobility shall be granted by the United States; and no person holding any office of profit or trust under them shall, without the consent of the congress, accept of any present, emolument, office, or title, of any kind whatever, from any king, prince, or foreign state. With regard to individual states it is provided, that no state shall enter into any treaty, alliance, or confederation; grant letters of marque and reprisal; coin money; emit bills of credit; make any thing but gold and silver coin a tender in payment of debts; pass any bill of attainder, ex post facto law, or law impairing the obligation of contracts; or grant any title of nobility. Moreover, no state shall, without the consent of the congress, lay any imposts or duties on imports or exports, except what may be absolutely necessary for executing its inspection laws; and the net produce of all duties and imposts, laid by any state on imports or exports, shall be for the use of the treasury of the United States; and all such laws shall be subject to the revision and control of the congress. No state shall, without the consent of congress, lay any duty of tonnage, keep troops or ships of war in time of peace, enter into any agreement or compact with another state, or with a foreign power, or engage in war, unless actually invaded, or in such imminent danger as will not admit of delay. The congress, under certain limitations, whenever two-thirds of both houses shall deem it necessary, may propose amendments to the constitution, established Sept. 17, 1787; or, on the application of the legislature of two-thirds of the several states, shall call a convention for proposing amendments, which, in either case, shall be valid, to all intents and purposes, as part of the constitution, when ratified by the legislatures of three-fourths of the several states, or by conventions in three-fourths thereof, as the one or the other mode of ratification may be proposed by the congress. The senators and representatives before-mentioned, and the members of the several state legislatures, and all executive and judicial officers, both of the United States, and of the several states, shall be bound by oath or affirmation, to support the constitution; but no religious test shall ever be required as a qualification to any office, or public trust, under the United States. The executive power is vested in a president of the United States of America. See President.

Congress, in Law, is also used for an essay, or trial, made by appointment of a lay, or spiritual judge, in the presence of furgons and matrons, to prove, whether or no a man be or be not impotent; in order to the dissolution of a marriage See Impotence.

Neither the civil nor canon law make any mention of this trial of virility by congress; it had its origin in France, from the boldness of a young fellow, who, in an open court, being hard pressed by his wife, demanded the congress. The judge, surprised with the novelty of the demand, found it could not be denied; as being the first evidence the court could admit of.

In time it became a branch in the French jurisprudence, and was authorized by decrees and arrêts; it obtained for about the space of one hundred and twenty years, and was annulled by an arrêt of parliament in 1677, as being found precarious; some having failed under the experiment cut of mere modesty and shame, which is found to have the same effect with actual impotency.

CONERE,
CONGREVE, William, in Biography, a celebrated English dramatic writer, descended from an ancient family in Staffordshire, which traces its lineage beyond the Norman conquest. Neither the time nor the place of his birth can be ascertained with any degree of precision; according to the inscription on his monument, it was in the year 1672, and he himself declares that he owed his nativity to England; though by many of his biographers it has been asserted that he was born in Ireland. Wherever he was born, it is known that he was educated, first at Kilkenney, and afterwards at Dublin, his father having some military employment that stationed him in Ireland. After he had made the usual preparatory studies, he was sent, at the age of sixteen, to study the law in the Middle Temple. For this his genius does not appear to have been adapted: he looked, at a very early period of life, to polite literature as that by which he might be distinguished. By a signed name he published the "Inconstancy, or Love and Duty reconciled," a novel, which has been characterized as frigintly in dialogue, intricate in plot, and unnatural; and Dr. Johnson says "he would rather praise than read it." As a dramatic writer, Congreve's first piece was the "Old Bachelor," written at the age of twenty, and, according to the author's own account, to amuse himself in a slow recovery from a fit of ficklness; but which was regarded by Dryden, and others who were his contemporaries, as a very wonderful performance. Its success was very great; few plays have been so beneficial to the writer, for it procured him the patronage of the earl of Halifax, who was the Mecenas of the day, and who deferves the praise of having bestowed more public patronage on the muses than they have ever received before, or perhaps since, in this country. Upon Congreve the noble lord bestowed the office of commissioner for licensing coaches; and soon after gave him a place in the pipe-office, and another in the customes of 1697, per annum.

If the Old Bachelor be nearly examined, says Dr. Johnson, "it will be found to be one of those comedies which may be made by a mind vigorous and active, and furnished with comic characters by the perusal of other poets, without much actual commerce with mankind. The dialogue is one constant recreation of conceits, or claff of wit, in which nothing flows necessarily from the occasion, or is dictated by nature. The characters both of men and women are either fictitious or artificial; and the catastrophe arises from a mistake not very probably produced, by marrying a woman in a mask. Yet this gay comedy, when all these deductions are made, will still remain the work of very powerful and fertile faculties; the dialogue is quick and sparkling; the incidents such as seize the attention, and the wit so exuberant that, it "o'er-informs its temenent."

Congreve's next play was "The Double Dealer," which was not received with equal kindness by the public, but which was honoured with the patronage of the queen, on whose death he wrote a poetical tribute to her memory; in which, says his biographer, "all is unnatural, and yet nothing is new." In the year 1695, his prolific pen produced "Love for Love," a comedy of nearer alliance to life, and exhibiting more real manners, than either of the former. This proved a very popular and profitable piece; and in the same year he published an irregular ode to King William, on the taking of Namur; which exhibited less of the powers of poetry, than of the spirit of loyalty. With the comedy of Love for Love, the new theatre was opened, under the direction of Betterton the tragedian; where, in 1697, was exhibited "The Mourning Bride," a tragedy, so written, as to shew that the author was sufficiently qualified for either kind of dramatic poetry.

About this time began a long and bitter controversy between Jeremy Collier and the poets. In the reign of Charles I, the puritans had raised a violent clamour against the drama, which they regarded as unfit for the encouragement of Christians. This had in a great measure subsided, when, in 1668, Collier published "A Short View of the Immorality and Profaneness of the English Stage," in which he attacked with great justice, though perhaps with some degree of aggravation, the licentiousness of the dramatic writers, among whom Congreve was included. The poet replied, and endeavored to palliate the alleged enormity of particular passages, though it was impossible to vindicate the general character and tendency of his pieces. Collier in reply, and Congreve retired from the contest; and shortly after published his last comedy of "The Way of the World." This was reckoned the most perfect of his dramatic pieces; but it was received with so little favour on the stage, that, being in a high degree offended and disturbed, he resolved to commit his quiet and his name no more to the caprices of an audience. From this time his life ceased to the public; he lived for himself and for his friends; and among his friends he was able to name every man of his time whom wit and elegance had raised to reputation.

Congreve continued to write copious verses upon particular occasions, and in the year 1710, he published a collection of his plays and miscellaneous poems, dedicated to his patron lord Halifax, to whose person and party he remained attached in all fortunes. Such was the respect which Congreve inspired, as well by his private character as his pen, that in the great political change which brought the tones into power, his places were untouched, and he was allowed to maintain a dignified neutrality, praised and complimented on both sides. On the return of his own friends to power, his emoluments were increased by the fine place of secretary to the island of Jamaica, which raised his public income to full 1200l. a year; yet, says Dr. Johnson, his honours were far greater than his profits. Every writer mentioned him with respect; and, among other testimonies to his merit, Steele made him the patron of his "Micellaneous," and Pope inscribed to him his translation of the Iliad.

Indolence was the result of Congreve's affluence. He not only ceased to make any literary exertions, but seems, with a considerable degree of affectation, to have declined the character of a man of letters; and when he received a visit from Voltaire, the topic of his writings being introduced, Congreve spoke of them as trifles beneath him, and hinted that he expected to be visited only as a gentleman. Voltaire replied, that had Mr. Congreve been so unfortunate as to be a mere gentleman, he should never have been amusing of seeing him.

The latter years of his life were clouded with a considerable portion of fickleness and infirmity. Cataract in his eyes at length terminated in total blindness. The melancholy care was aggravated by the pain, for which he fought relief by a journey to Bath; but, being overturned in his chariot, he returned to his house in London, where he died, Jan. 26, 1728-9, in the sixtieth year of his age. Having lain in state in the Jerusalem chamber, he was buried in Wemminster Abbey, where a monument is erected to his memory by the duchess of Marlborough; to whom, for reasons either not known, or not mentioned, he bequeathed a legacy of ten thousand pounds, in preference to the claims of kindred, at that time reduced to difficulties and disfets.

It does not appear that any peculiar moral excellencies, or any remarkable talents for local intercourse, obtained for Congreve those marks of attachment and regard which
we have seen that he enjoyed. He lived in an easy independent, and, by the exercise of a polished good nature, pleased and flattered those who associated with him, and never offended any one. He stands first among the English writers of comedy: a distinction for which he is indebted, not to such a lively and humorous delineation of natural characters as delights and instructs in the scenes of Molière, but to a continuation of wit and repartee in the dialogue, joined with originality of plot. His personages are always strongly marked and well supported. One or two of his comedies are still exhibited, and beheld with pleasure, though so little resembling the productions of the present age. His "Mourning Bride" is interesting, and its principal characters well contrasted; it maintains its place in our theatres, and has, during the present season, been represented with the highest applause. Biogr. Britan. Johnson's Lives of the English Poets.

CONGRIER en Ponce, in Geography, a town of France, in the department of the Mayenne; 6¼ leagues S.W. of Laval.

CONGRUITY, or Congruency, in the Schools, a suitableness or relation of agreement between things; whereby we come at the knowledge of what may be expected from them.

The system of congruity in matters of grace consists in this; that God, who knows perfectly the nature of grace, and the dispositions of the will in all the circumstances that shall befall a man, gives graces, wherewith, by virtue of their congruity with the will of a man, confedered in those circumstances, man will always inafterily, but not necessarily, do what God would have him do; because the will, in the language of the congruits, does always inafterily, though voluntarily, choose what appears best.

CONGRUITY, merit et. See Merit.

CONGRUITY, in Geometry, is applied to figures, lines, &c. which exactly correspond when laid over one another; as having the same terms, or bounds.

Those things between which there is a congruity are equal and similar.

Euclid, and by his example, most other geomctricians, demonstrate all their elements from the sole principle of congruity: M. Leibnitz, and after him Wolfius, subliterate the notion of similitude in lieu of that of congruity.

CONGRUITY, in a lax sense, is used to express an aptitude, in some bodies, to unite, or incorporate; by reason of some similitude or fitness of their figures, as incongruity denotes an unsuitableness of their surfaces for joining together. Thus, quicksilver will unite with gold, and many other metals, but will roll off from wood, bone, glass, &c.; and water, which will wet salt, and disolve it, will slip off from tallow without adhering to it; as also from a dusty surface, and from the feathers of water fowl.

Two drops of water or of mercury, will, on contact, immediately join and coalesce; but oil of tartar, poured upon quicksilver, and spirit of wine and oil of turpentine on that, and air over all, will remain in the same vellum without any manner of union, or mixture with each other. And the cause of this phenomenon is, that the figures of some bodies will not admit other bodies near enough to be within their spheres of attraction, whence they cannot join and cohere; but where their fitnese of figure will let them approach near enough to feel each others' attractive power, then they close and hold together. See Cohesion.

CONG-TCHIN, in Geography, a town of China, of the third rank, in the province of Quang-si; 20 miles N.E. of Pien-lo.

CONGUSTUS, in Ancient Geography, a town of Asia, in Galatia. Ptolemy.

CONHOCTON CREEK, in Geography, a creek of America, in the western parts of the state of New York, in the Genesee country, which runs over a bed of gravel at the foot of the hills that surround the newly established post-town, called Bath, and, about 20 miles below this town, falls into the Chag river. In this creek there is a considerable fall, just above the town, which affords a very fine stream for mills. Extensive saw and flour mills have already been erected upon it; the principal saw in the former of which, gave, when Mr. Weld visited the mill, 120 strokes in a minute, sufficient to cut, in the same interval of time, 7 square feet, superficial measure, of oak timber; and yet capable, when the water is high, of producing effect much more expeditiously. During floods, light batteaux may pass along the creek, Tyoga and Susquehannah rivers, from Bath to Chieflapay bay, without interruption.

CONI, a large fortified town of France, in the department of Stura, which was formerly a part of Piedmont in Italy, belonging to the king of Sardinia. It is situated on the confines of the Geff and the Stura, 42 miles S. from Turin, 54 N.E. from Nice, and 820 kilometres, from Paris. As chief place of the department, it has a prefect, a court of justice, and several tax offices, and is the residence of the brigade-general commanding the department. The fertility of the soil of its district, equally abundant in corn and pastures, and the advantage of a canal which goes from the river Stura to the Po, and facilitates its communication with the interior parts of France, render Coni the centre of a considerable commerce. Its inhabitants amount to 16,500. The population of the canton, including 16 communes, is 17,775. The whole district comprises 85 communes with 121,433 inhabitants, upon a territorial extent of 2,530 kilometres.

Coni is said to have been first founded in 1520, during the pontificate of Calixtus II.; and the following account is given of its origin. The inhabitants of some villages having been grievously oppressed by their lords, who, among other enormities, pretended a privilege granted by the emperor to deflower the brides before the husbands touched them, the people, at length, attacked their lords, expelled them the country, and destroyed their castles, which had served as their protection, and left their oppressors should return with foreign aid, they left their home and founded Coni. Their number daily increasing, they formed an alliance with the city of Atri, and Lucchin, duke of Milan, and became a flourishing republic, which form of government continued for some years. At length they submitted to Charles of Anjou, count of Provence. Some time after his death, they came under Jane, queen of Naples, who was incapable of supporting the weight of government; and therefore the town of Coni, in order to ensure protection, voluntarily submitted to Amadeus VI., count of Savoy, to whom it afterwards continued faithful. After valiantly defending itself against many succedaneous sieges, for near three centuries, the rapid feculences of the French in Piedmont, during the months of April and May in 1796, obliged the king of Sardinia to make overtures for peace, and to surrender Coni, with Alexandria, Susa, and Turin, into the hands of the French, as hostages of his good faith; and it afterwards became the principal place of a district, as we have already stated, in one of the six Piedmontese departments, called Stura.

CONIA, in Botany, the name of a genus formed by Ventenat, for the powdery biff of Linnaeus and other authors.

CONIACI,
CONIC SECTIONS.

CONICI, in Ancient Geography, a people of Spain, placed by Strabo near the sources of the Ebrus, in the vicinity of the Cantabri.

CONIC SECTIONS, as the name imports, are such curve-lines as are produced by the mutual intersection of a plane and the surface of a solid cone. The nature and properties of these figures were the subject of an extensive branch of the Ancient Geometry, and formed a speculation well fitted to the subtle genius of the Greeks. In modern times, the conic geometry is intimately connected with every part of the higher mathematics and natural philosophy. A knowledge of those discoveries, that do the greatest honour to the last and the present centuries, cannot be attained without a familiar acquaintance with the figures that are now to engage our attention.

In this article we shall treat of the cone, and the more general properties of those figures called the conic sections; and we shall conclude with a short historical account of this branch of mathematical learning. The more particular properties of each figure will be delivered under the proper heads in the progress of our work.

We begin with premising a few lemmas, on which the theory of conic sections, we are to deliver, is founded.

**Lemmas.**

**Definition.** If a right line, A B (Plate II. Conics. fig. 1.), be so divided in the points D and E, that A D is to D B as AE is to EB; then that right line is said to be harmonically divided.

Cor. If a right line, A B, be divided in E, then it cannot be cut in D and d, so as to be harmonically divided both in E and D, and in E and d.

Cor. If it were possible, it is plain that A D would be to D B as A d to D b, 11. 5. E: which is absurd, 14. 5. E.

**Lemma I.** Fig. 1.

If a right line, A B, be divided in C, and cut in E and D, so that C A or C B is a mean proportional between C E and C D: then A B is harmonically divided in C and D.

For, because C D : C A :: C A : C E, therefore, CD + CA : CD = CA : CE; CA : CE = CA : CE that is, A D : D B = A E : E B.

Cor. If A B be divided in C, and harmonically divided in D and E, then A C or C B is a mean proportional between C D and C E. Cor. Def. 1.

**Lemma II.** Fig. 2.

If two tangents of a circle be drawn from the same point, A, then any chord of the circle, as E D, which, being produced, passes through A, and cuts the line, B C, that joins the two points of contact, in F, is harmonically divided in the points F and A.

Let O be the centre of the circle, and draw O H perpendicular to E D, and draw O B and O C to the points of contact. Because the angles at B, H, and C, are all right angles, 18. 3. E, the circle described on the diameter A O will pass through A, B, H, O, and C. 31. 3. E; therefore A F x F H + F H x H = F C x E F = E F x F D; 25. 3. E; therefore, A F x F H + F H x H = E F x F D + F H x F H, or A H x F H = E F x F D + F H x F H = (because E D is bisected in H) H D x D. 5. 2. E. Therefore E D is harmonically divided in F and A, Lem. 1.

Cor. And if a chord, as E D, which, when produced, passes through A, be harmonically divided in A and F, then F is a point in the chord B C.

For, if not, then the chord, DE, could be harmonically divided at A and F, and also at A, and another point, different from F, which is absurd, Cor. Def.

**Lemma III.** Fig. 3 and 4.

Let C be the centre of a circle, and let D and E be two points in a diameter, A B, and both on the same side of the centre; and let the radius of the circle be a mean proportional between C D and C E: draw M N perpendicular to A B through E; then any chord, as H K, which, being produced if necessary, passes through D, and cuts M N in F, is harmonically divided in D and F.

Draw C L perpendicular to H K from the centre C. Because C A² = C D x D E, therefore C A² = C D x C F; or A D x D B = E C x C D + C D x C F; or C D x C E, or C D x D E. And because the angles at E and L are right angles, therefore L D x D F = C D x D E = A D x D B = H D x D K, 35. 3. E. = (because H K is bisected in L), L K² = D L² (or D L² = L K²). Therefore, L K² = D L² + L D x D F (or D L² = L D x D F); therefore H K is harmonically divided in D and F. Lem. 1.

**Lemma IV.** Fig. 5 and 6.

The same construction being made as in the last lemma, if H K be a chord, which, when produced if necessary, passes through D; then tangents of the circle drawn from the extremities of H K will meet one another in the line M N. And if tangents of the circle be drawn from a point afiinued to M N, the chord drawn through the two points of contact, being produced if necessary, will pass through the point D.

Let H K be a chord passing through D, and let tangents drawn from H and K meet in F: draw C F (cutting H K in L) to the centre of the circle, and join K C and F E. It is manifest that F C x C L = C K², 8. 6. E = C D x C E, hyp. Therefore a circle described through D, F, and L, will pass through E, 36. 3. E; and therefore the angle F E D = the angle F L D, 21. 1. E. Therefore F E is perpendicular to A B, and F is a point in M N drawn from E perpendicular to A B.

Next, let F be in M N, and let H K and A B, both produced if necessary, intersect in d. Because the angles F L D and F E D are right angles; therefore F C x C L = C K², 36. 3. E. But F C x C L = C K² = C D x C E; therefore C E x C D = C D x C E; therefore the point d, in which H K and A B intersect, is the same as the point D.

**Lemma V.** Fig. 7.

If the bafe of a triangle, A B, be bisected in D, and C G be drawn parallel to A B through the vertex; then any line, as E F, parallel to C D, and terminated by C D and C A, produced if necessary, is bisected by C G.

Draw B H K parallel to C D. Because A D = D B; therefore A C = C K², 2. 6. E. Therefore B H = H K, and, it is plain that E F, parallel to B K, is likewise bisected.

**Lemma VI.** Fig. 8 and 9.

If A B, the bafe of a triangle, be harmonically divided in D and E, and the lines C D and C E be drawn; then any line, as H F, parallel to C E, and terminated by B C and C A, produced if necessary, is bisected by C D.

Draw L K parallel to C E through D. Because A D : D B : A E : E B. Alternando, A D : A E : D B : E B.

But, on account of equiangular triangles, A D : A E : D L : C E, 4. 6. E. and D B : B E : D K : C E, therefore D L : C E : D K : C E.

Therefore
CONIC SECTIONS.

Therefore $DL = DK$, $p. 5$, E. Therefore any line parallel to $L K$, as $F H$, is bisected by $CD$.
Cor. If $L H$ be bisected by $C D$, and $C E$ be parallel to $L H$, then $A B$ is harmonically divided in $D$ and $E$.
For, if not, then $L H$ could be bisected by two lines drawn through $C$; which is absurd.

Of the Cone and its Sections.

Definitions.

Fig. 10. 1. Let $A D B$ be a circle, and $V$ a fixed point without the plane of the circle; then, if a right line, falling continually through the point $V$, be carried round the whole periphery of the circle $A D B$, that right line, being extended indefinitely on the same side of $V$ as the circle, will describe a conic surface; and, if it be likewise extended indefinitely on the other side of $V$, it will describe two opposite conic surfaces.

Cor. A straight line drawn from the vertex to any point in a conic surface, being produced indefinitely, is wholly in the opposite surfaces.

For a line, so drawn, will coincide with the line that generates the cone surfaces, when this line, by being carried round the circumference of the base, comes to the proposed point.

II. The solid figure, contained by the conic surface and the circle $A D B$, is called a cone. The point $V$ is named the vertex of the cone; the line $V C$, drawn to the centre of the circle, the axis of the cone; and the circle $A D B$, the base of the cone.

III. A right cone is when the axis is perpendicular to the plane of the base; otherwise, it is a falcate, or oblique cone.

IV. A right line that meets a conic surface in one point only, and is everywhere else without that surface, is called a tangent.

Prop. I. Fig. 10.
The common intersection of a conic surface and a plane $V D E$, that passes through the vertex, and cuts the base of the cone, is a rectilinear triangle.
For the common section of the plane of the base, and the plane drawn through the vertex, (which is a right line, $5. 11$, E.), will cut the periphery of the base in two points, $D$ and $E$, and in these two points only: then, having drawn $D V$ and $E V$ to the vertex of the cone, these lines will both be in the conic surface (Cor. Def. 1.), and also in the plane surface; and there are no points, excepting in these lines indefinitely produced, which are common to both the surfaces. Therefore the figure $D V E$, which is the common intersection of the cone and a plane through the vertex, is a rectilinear triangle.

Prop. II. Fig. 11 and 12.
If two points, $D$ and $E$, (not in the same right line with the vertex) be assumed in a conic surface, the right line that joins them falls wholly within the conic surface, and when produced both ways it falls wholly without the surface; but if the assumed points be in opposite surfaces, the right line that joins them falls without the conic surfaces, and, when produced, it falls within one conic surface on one side, and within the other conic surface on the other side.
From $V$, the vertex of the cone, draw the lines $V D$ and $V E$, cutting the periphery of the base in the points $B$ and $C$; then, a plane being drawn through the vertex and the points $D$ and $E$, that plane will cut the base in the chord $B C$, and the common sections of the plane and the conic surfaces are the two right lines $V B$ and $V C$ indefinitely produced, $P r. 1$. Now the right line $D E$, which is wholly contained in this plane, can meet the lines $V B$ and $V C$ only in the points $D$ and $E$. When the points $D$ and $E$ are in the same conic surface, then the line $D E$ is contained in the angle $B V C$ within the conic surface, and, produced both ways, it is contained in the adjacent angles $B V M$ and $C V N$ without the conic surface. On the other hand, when $D$ and $E$ are in opposite surfaces, $D E$ is contained in the angle $B V M$, or $C V N$, without the conic surfaces, and, being produced both ways, it is contained either in the angle $B V C$, or in the angle $M V N$, within the conic surfaces.
Cor. A right line cannot meet a conic surface in more than two points.

Prop. III. Fig. 11.
If a point, $E$, be assumed in a conic surface, and a line, $P Q$, be drawn through it, so as to be parallel to a right line, $V E$, passing through the vertex, and contained in the conic surfaces; then the right line, $P Q$, will not meet either of the opposite surfaces in another point, but it will fall within the surface, in which the assumed point $E$ is, on the one side, and it will be wholly without both surfaces on the other side.
For if a plane be conceived to be drawn through the line $V E$ and the point $P$, the line $P Q$, parallel to $V E$, will be wholly in that plane, $7. 11$, E.; and the common sections of the plane and the conic surfaces will be the line $V E$ and the line $V E C$ drawn through the vertex and the point $E$, $P r. 1$. Now the line, $Q P$, does not meet either of the lines $V B$ or $V C$ in another point different from $E$. Also if $Q E$, the part of the line that is contained in the angle $B V C$, is within the cone; and $P E$, the part of it that is contained in the angle $C V N$, is without both the opposite surfaces.

Prop. IV. Fig. 12.
If a plane be drawn through the vertex of a cone and a tangent of the conic surface $G H$, it will meet the conic surface only in the line, $V D$, drawn through the vertex of the cone and the point of contact of the tangent.
For, because the point $D$ and the vertex $V$ are common both to the plane surface and to the conic surface, therefore the line $V D$, indefinitely produced, is likewise common to both surfaces. And because $G H$ meets the conic surface only in the point $D$, and is every where else without the surface, therefore any line (different from $V D$), as $V F$, drawn in one of the conic surfaces, is contained on one side of the plane; and the same line contained in the opposite conic surface, as $V K$, is contained on the other side of the plane.
Cor. 1. Any straight line, drawn in the plane, $V G H$, so as to meet the line $V D$, is a tangent of the conic surfaces.
Cor. 2. No other plane, besides the plane $V G H$, can be drawn so as to touch the conic surfaces in the line $V D$ without cutting them.
For, $R S$ the common section of the plane $V G H$, and the plane of the base, is a tangent to the periphery of the base, $C o r. 1$. And, if there were two such planes, there would likewise be two tangents of a circle drawn through the same point of the periphery, which is absurd.

Prop. V. Fig. 13.
If either of two opposite conic surfaces be cut by a plane parallel to the base of the cone, the section is a circle, having its centre in the axis of the cone.
Through VC, the axis of the cone, let two planes be drawn cutting the base in the lines CD and CE; and the plane parallel to the base, in the lines GH and GL; and the conic surfaces in the lines VHD and VLE; then, because the base is parallel to the cutting plane, therefore CD is parallel to GH and CE to GL, 15. 11. E. Therefore, on account of equiangular triangles, 4. 6. E.

DC : CV = HG : GV
CV : CE = GV : GL

Ex æquo DC : CE = HG : GL

But DC = CE, therefore HG = GL. And in like manner it may be shown that any right line, drawn from G to a point in the intersection of the plane, and the conic surface, is equal to GH; therefore the section is a circle.

Cor. 1. If, through a point situated within or without a conic surface, two straight lines, both parallel to the plane of the base of the cone (that is, parallel to straight lines in that plane), be drawn to cut, or touch the conic surface: then the rectangle contained by the two segments (between the point and the conic surface), of one of the lines when it cuts, or the square of its segment when it touches the conic surface, is equal to the rectangle contained by the two segments of the other line when it cuts, or to the square of its segment when it touches the conic surface.

For a plane drawn through the two lines will be parallel to the plane of the base, 15. 16. E; and it will intersect the conic surface in the periphery of a circle: whence the corollary is manifest, 35 and 39. 3. E.

Prop. VI. Fig. 14.

If two diameters of the base of a cone, as AB and CD, intersect one another at right angles, a plane drawn through the vertex of the cone, and one of the diameters, CD, will bisect any straight line, as EF, terminated both ways by one of the conic surfaces, and parallel to the other diameter AB.

Through V and EF draw a plane cutting the conic surface in the lines VG and VK, and the plane of the base in the line GHK; because EF is parallel to AB; therefore GK is parallel both to AB and EF, 16. 11. E; and it is perpendicular to CD; therefore GK is bisected by the diameter CD, 3. 3. E. And, because GK is bisected in H, therefore EF, parallel to GK, is bisected by VH, that is, by the plane drawn through V and CD.

Prop. VII. Fig. 15. Plate III.

If a point, as B, be assumed in the plane of the base of a cone, but without the periphery of the base, and, from that point, two tangents, BP and BQ, be drawn to the base, and likewise a straight line, BV, to the vertex of the cone: then any straight line, as EF, parallel to BV, and terminated both ways by one of the conic surfaces, is bisected by a plane drawn through V, the vertex of the cone, and cutting the plane of the base in the chord PQ, 16. 11. E.

Because BV and EF are parallel to one another, therefore they are in one plane, 7. 11. E: let the plane, drawn through BV and EF, cut the conic surface in the lines VEG and VFK; and let the same plane cut the plane of the base in the line BGK, and the plane passing through V, and the chord PQ in the line VDH. Because GK is harmonically divided in H and B, Lem. 2. therefore EF, parallel to VB, is bisected by the line VH, Lem. 6. But D, the point where VH cuts EF, is the point where the plane drawn through V and the chord PQ cuts EF; therefore EF, parallel to BV, is bisected by that plane.

Prop. VIII. Fig. 16.

Let a plane, passing through the vertex of a cone, cut the plane of the base in a diameter of the base CD; and let AB, a diameter of the base, be perpendicular to CD; and let MN be drawn through the vertex of the cone parallel to AB; then if a right line GK, in the plane CVD, and terminated by one of the conic surfaces, be bisected by a plane passing through MN, this plane will bisect all right lines terminated by one of the conic surfaces and parallel to GK.

Let the plane which bisects GK cut the plane of the base in the line PQ, and the plane CVD in the line VHO: through V draw VL parallel to GK, and let it meet CD produced in L. Because MN is parallel to AB; therefore PQ (the common section of two planes drawn through MN and AB) is parallel to MN and to AB, 16. 11. E; therefore PQ is perpendicular to CD. Because GK is bisected by VO, and is parallel to VL; therefore CD, the base of the triangle CVD, is harmonically divided in L and O, Cor. Lem. 6. consequently, if two tangents of the base be drawn from L, the chord that joins the points of contact of these tangents will pass through O, Cor. Lem. 2; and it will be perpendicular to the diameter CD; therefore that chord will coincide with the line PQ, which is the only line that can be drawn through O perpendicular to CD. Therefore all right lines, terminated by one of the conic surfaces, and parallel to VL or GK, are bisected by the plane VQP drawn through MN to bisect GK, Pr. 7.

If GK be parallel to CD, then CD will be bisected in O, and PQ will coincide with AB; so that this proposition, in this case of it, is the same as Prop. 6.

Cor. If a plane be drawn through MN to bisect any right line terminated by one of the conic surfaces, and parallel to a line GK in the plane VCD, the same plane will bisect all right lines terminated by one of the conic surfaces and parallel to GK.

For, if not, then the same straight line could be bisected by two planes both passing through MN, which is absurd.

Prop. IX. Fig. 17.

Let a plane, passing through the vertex of a cone, cut the plane of the base in a line CD, not passing through E the centre of the base: draw the diameter, AB, perpendicular to CD, and produce it to M; so that EM may be a third proportional to EF and EB the radius of the base of the cone, and draw MVM through the vertex: then, if a right line GK, in the plane CVD, and terminated by one of the conic surfaces, be bisected by a plane passing through MN, this plane will bisect all right lines terminated by one of the conic surfaces and parallel to GK.

Let the plane which bisects GK cut the plane of the base in the line PQM, and the plane CVD in the line VHO: through V draw VL parallel to GK, and let it cut CD produced in L. Because VO bisects GK, and VL is parallel to GK, therefore CD, the base of the triangle CVD, is harmonically divided in O and L, Cor. Lem. 6; therefore if two tangents of the base be drawn from L, the chord that joins the points of contact of these tangents will pass through the point O, Cor. Lem. 2; but the same chord, being produced, likewise passes through the point M, Lem. 4: therefore that chord will coincide with PQ, which is the only right line that can pass through both the points O and M, therefore all right lines terminated by one of the conic surfaces and parallel to LV, or GK, are bisected by the plane VQP drawn through MN to bisect GK, Pr. 7.

Cor.
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Cor. If a plane be drawn through MN to bisect any one right line, terminated by a conic surface, and parallel to a line G K, in the plane V C D, or parallel to the plane V C D, that plane will bisect all right lines terminated by a conic surface, and parallel to G K.

For, if not, then the same right line could be bisected by two planes, both passing through M N; which is absurd.

Prop. X. Fig. 18.

Let a plane, passing through the vertex of a cone, cut the plane of the base in a line C D, which neither cuts nor touches the periphery of the base: draw A B E, through E, the centre of the base, perpendicular to C D, and take E M, a third proportional to E F, and the radius of the base of the cone; and draw M V through the vertex: then if a right line G K, parallel to the plane V C D, and terminated by one of the conic surfaces, be bisected by a plane passing through M V, this plane will bisect all right lines terminated by one of the conic surfaces, and parallel to G K. But the point H, in which the plane, that bisects G K, cuts G K, must not be in the same right line with the point M, and the vertex of the cone.

Let the plane, which bisects G K, cut the plane of the base in the line P Q, draw V P parallel to G K; and because G K is parallel to the plane V C D, therefore V L parallel to G K, is in the plane V C D, and it will cut the plane of the base in L, a point of the line C D. And, because G K is parallel to V L, therefore they are contained in one plane; 7. 11. E. Let this plane be drawn, and let it cut the conic surface in V R and V S, the plane of the base in L R S, and the plane V P Q, in V O. Because G K is parallel to V L, and it is bisected by V O, therefore S K, the base of the triangle S V R, is harmonically divided in O and L, Cor. Lem. 6; therefore, if two tangents of the base be drawn from L, the chord that joins the points of these tangents will pass through the point O, Cor. Lem. 2; but, because the point O does not fall upon M, therefore the chord will coincide with P Q, which is the only line that can pass both through O and M. Therefore, all right lines, terminated both ways by one of the conic surfaces, and parallel to V L, or G K, are bisected by the plane, V P Q. Pr. 7.

Prop. XI. Fig. 19.

Let a plane touching a conic surface cut the plane of the base in a line, C D, which touches the periphery of the base in P; then, if a right line, G K, terminated by one of the conic surfaces, and parallel to the touching plane, V C D, be bisected by a plane drawn through V P; this plane will bisect all right lines parallel to G K, and terminated by one of the conic surfaces.

Through V draw V L parallel to G K: because G K is parallel to the plane V C D, therefore, V L, parallel to G K, is in the plane V C D, and it will cut the plane of the base in L, a point in C D. And, because V L is parallel to G K, therefore they are contained in one plane, 7. 11. E.; let this plane be drawn, and let it cut the conic surface in the lines V M and V N, the plane of the base in the line L M N, and the plane V Q P, in the line V O. Because G K is parallel to V L, and it is bisected by V O, therefore, M N, the base of the triangle V M N, is harmonically divided in O and L, Cor. Lem. 6. Theretore, if two tangents of the base be drawn from L, the chord that joins the two points of contact of these tangents will pass through the point O, Cor. Lem. 2; but the same chord likewise passes through Q, which is one of the points of contact of tangents drawn from L; therefore, the chord coincides with the line Q P. Therefore the plane V Q P, bisects all right lines terminated by one of the conic surfaces, and parallel to V L, or G K, Pr. 7.

Fig. 20, 21, 22, 23. If a cone be cut by a plane P Q, which neither passes through the vertex, nor is parallel to the base, then, a plane, as V M N, being drawn through the vertex parallel to the cutting plane, it will necessarily meet the plane of the base of the cone. The line of common section of the parallel plane, and the base of the cone M N, may have one or other of three different positions; viz.

Def. V. If the line of common section, M N, (Fig. 20.), be without the base of the cone, then the plane V M N, drawn through the vertex, will be entirely between the two conic surfaces, not meeting either of them. In this case, the cutting plane P Q, will meet every line drawn from the vertex in one of the conic surfaces, and the curve line of common section will surround that conic surface, and will completely enclose a space. In this position of the cutting plane, the conic section is called an ellipse.

Def. VI. If the line of common section M N, (Fig. 21.) touch the periphery of the base, then the plane drawn through the vertex will touch the conic surfaces, Pr. 4. And the opposite surfaces will be on different sides of it. In this case also the cutting plane will meet every line drawn from the vertex in one of the conic surfaces, excepting only the line of contact, V B, in which the touching plane meets that conic surface: and as the cutting plane is indefinitely extended along the touching plane without meeting it, it is obvious that the curve line formed by the common section of the cutting plane and the conic surface does not return into itself so as to enclose a space, but it is open on the side opposite to the vertex of the cone. In this position of the cutting plane, the conic section is called a parabola.

Def. VII. If the line of common section MN (Figs. 22 & 23.) cut the periphery of the base, then the plane drawn through the vertex will divide each of the opposite conic surfaces into two parts lying on opposite sides of it. In this case the cutting plane being indefinitely extended will meet every line drawn from the vertex in those parts of the two conic surfaces that lie in the same side of the plane, through the vertex, as the cutting plane itself; and thus two curve lines will be formed by the common intersection of the cutting plane, and the two opposite conic surfaces. It is obvious that these curve lines may be indefinitely extended, and that they do not return into themselves so as to enclose a space. In this position of the cutting plane the conic section, formed by its intersection with one of the conic surfaces is called a hyperbola; and the two conic sections formed by its intersections with the two opposite conic surfaces, are called opposite hyperbolas, or opposite sections.

Def. VIII. The nature of the several conic sections defined in the three last definitions depends entirely, as we have seen, on the relative position that the line of common section of the plane of the base and the plane drawn through the vertex parallel to the cutting plane, has in respect to the circle
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cle that forms the base of the cone. As there will be frequent occasion to refer to this line, in the following theory of the conic sections, it will be requisite, for the sake of abbreviating language, to distinguish it by a peculiar name. For this purpose we shall call it the determining line.

Def. IX. Let a plane, as P Q, (fig. 20 and 22,) cut a conic surface, or opposite surfaces, and let M N be the determining line, or the common section, of the plane of the base and the plane drawn through the vertex parallel to the plane P Q; from C, the centre of the base of the cone, draw C D perpendicular to M N, and take C E a third proportional to C D and C A or C B, the radius of the base; then, a line being drawn from the vertex V to the point E, it will meet the plane P Q in a point G, which is called the centre of the conic section, or opposite sections, formed by the common intersection of the plane P Q, and the conic surface, or opposite surfaces.

But, if the determining line M N (fig. 23,) cut the base of the cone, and pass through its centre, then, the diameter A B being perpendicular to M N, and V G being drawn through the vertex parallel to A B; V G will meet the plane P Q in a point G, which, in this case, is the centre of the opposite sections.

Fig. 22, 22, 23. Cor. 1. The centre of an ellipse is a point within the figure; but the centre of two opposite hyperbolas is a point without both hyperbolas, and situated between them.

For, when the line M N is without the base of the cone, the point E and the line V E are within the conic surface; but, when M N cuts the base, then E and V E are without both of the two conic surfaces and between them.

Cor. 2. A parabola has no centre.

Def. X. A right line drawn in the plane of a conic section so as to meet the curve of the section in one point only, and which, being produced both ways, is contained on one and the same side of the section, is called a tangent of the section.

Cor. 1. A tangent of a conic section is a tangent of the conic surface.

For it can meet the conic surface only in the point in which it meets the section.

Cor. 2. There cannot be more than one tangent of a conic section at the same point of the curve.

For if there were two tangents, then two planes drawn through them and the vertex of the cone would meet the conic surface in the same right line without cutting the conic surface, which is absurd.

Cor. 2. Pr. 4.

Prop. XII.

A right line, drawn in the plane of a conic section, cannot meet the curve in more than two points.

For such a line does not meet the conic surface in more than two points.

Cor. 2.

Prop. XIII.

A right line drawn through a point in a conic section, in the same plane with it, and parallel to a line drawn from the vertex in the conic surface, does not meet the curve of the conic section again in another point.

For it does not meet the conic surface in another point.

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Pr. 3. Thus, in the parabola, if P Q be drawn parallel to V B, (fig. 21,) then P Q meets the curve only in the point P.

Prop. XIV. Figs. 24, 25, and 26. Plate IV.

Every right line, as F H, drawn through G, the centre of an ellipse, or opposite hyperbolas, and terminated both ways by the curve, or opposite curves, is bisected in the centre.

I. When the determining line M N, (fig. 24 and 25,) does not pass through the centre of the base. Through V, the vertex of the cone, and the line F H, draw a plane cutting the conic surface in the lines V H L and V F K, and the plane of the base in the line L M, and the plane V M N in the line V M. Because the point G is in the line V G E; therefore, the line L M K will pass through the point E.

And because F H and V M are the common sections of the plane V K L, and two parallel planes (viz., the plane of the section and the plane V M N), therefore F H is parallel to V M, and E. And, because C B or C A, the radius of the base of the cone, is a mean proportional between C D and C E, and M N is perpendicular to A B; therefore, the chord K L is harmonically divided in E and M, Lem. 3. And because K L is the base of the triangle K V L, and F H is parallel to V M, therefore, F H is bisected by V E, Lem. 6.: that is, T F G = G H.

In the ellipse, when F H (fig. 20) is parallel to M N, it will be perpendicular to a diameter of the base drawn perpendicular to the diameter A B; therefore, it is bisected by the plane V A B, which cuts it in G, Pr. 6.

II. When the determining line, (fig. 26,) passes through the centre of the base. In this case, V G is parallel to the diameter A B, Def. IX. And L K, the common section of the plane V K L, and the plane V Q K (drawn through V, and the line F G H), is parallel both to A B and to V G, 7. 11. E. But the diameter M N is perpendicular to the diameter A B; therefore, it is also perpendicular to K L, and bisects K L, 3. 3. E. And because F H and V M are the common sections of two parallel planes (viz., the plane of the conic section, and the plane V M N), therefore F H is parallel to V M. And because V M bisects the base of the triangle K V L, and V G is parallel to that base, therefore V G bisects F H parallel to V M. Lem. 5.

Definitions.

XI. A right line drawn through the centre of an ellipse, or opposite hyperbolas, and terminated both ways by the curve or opposite curves, is called a diameter of the ellipse, and a transverse diameter of the opposite hyperbolas.

XII. A right line in the plane of a parabola, as P Q, (fig. 21,) drawn parallel to the right line V B, in the conic surface (which passes through the vertex of the cone, and the point in which the determining line touches the periphery of the base), is called a diameter of the parabola.

Cor. All the diameters of a parabola are parallel to one another.

XIII. A vertex of a diameter is a point where the diameter meets the curve of the conic section.

Cor. A diameter of a parabola has only one vertex,

Pr. 13.

XIV. A right line (which is not a diameter of an ellipse), terminated both ways by the curve of a conic section, and bisected by a diameter of the section, is said to be ordinately applied to that diameter; or it is called a double 3 G ordinate;
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Prop. XV. Fig. 24, 25, and 26.

If a straight line be ordinarily applied to a diameter of an ellipse, or a parabola, or to a transverse diameter of a hyperbola, then all right lines parallel to it and terminated both ways by the same curve, or by the opposite curve, are ordinarily applied to the same diameter.

Let $RST$ (fig. 24 and 25.) be ordinarily applied to $FH$, a diameter of an ellipse or a parabola, or a transverse diameter of a hyperbola, or opposite hyperbolae; then all other right lines, as $PQ$, parallel to $RT$, and terminated by the same curve, or the opposite curve, are ordinarily applied to the same diameter $FH$. Draw a plane through $V$, the vertex of the cone, and the diameter $FH$. Then, in the case of the ellipse and hyperbola, when the determining line does not pass through the centre of the base, this plane will necessarily pass through the line $VE$. And, because the plane of the conic section is parallel to the plane $VMN$, therefore $RT$, in the former plane, is parallel to the latter plane. And because the plane drawn through $V$, and the diameter $FH$, passes through $VE$, and bisects $RT$, which it cuts in $S$, a point not in the same right line with $V$ and $E$; therefore, the same plane will bisect all right lines in either of the opposite cones that are parallel to $RT$. Pr. 10. and Cor. 9. Therefore, the diameter $FH$ in that plane will bisect all the right lines which it meets, that are parallel to $RT$, and terminated by the section, or either of the opposite sections.

And, when the determining line passes through the centre of the base (fig. 26), as before, $RT$ is parallel to the plane $VMN$. And the diameter $AB$ is perpendicular to the diameter $MN$, and $V$ is parallel to $AB$, Diff. IX; therefore, the plane drawn through $V$ and $H$, which bisects $RT$, will bisect all right lines in either of the opposite cones that are parallel to $RT$, Pr. 8. Therefore, $FH$ in that plane will bisect all the right lines which it meets, that are parallel to $RT$, and terminated by either of the opposite hyperbolas.

In the parabola, because the plane of the section is parallel to the plane $VMN$; therefore, $RT$. (fig. 27.) in the former plane, is parallel to the latter plane. And because $AB$ is parallel to $FH$, therefore a plane may be drawn through them both; let this plane be drawn, and it will bisect all right lines in either of the opposite cones that are parallel to $RT$, Pr. 11. Therefore, $FH$, in that plane, will bisect all the right lines which it meets, that are parallel to $RT$, and terminated by the curve of the parabola.

Prop. XVII. Fig. 24 and 27.

A diameter of a conic section being given, to draw a right line that shall be ordinarily applied to that diameter.

Fig. 24. Let $FH$ be a diameter of an ellipse; draw a plane through the vertex $V$, and the diameter $FH$, cutting the plane of the base in the chord $KL$, which necessarily passes through the point $E$; draw tangents of the base from $K$ and $L$, and let them intersect in $O$. Then $O$ is a point in the determining line $MN$; Lem. 4; and $VO$ being drawn to the vertex of the cone, it is in the plane $VMN$, and parallel to the plane of the ellipse. Now, all straight lines, as $PQ$ and $RT$, in the plane of the ellipse, drawn parallel to $VO$, are ordinarily applied to the diameter $FH$; for these lines are all bisected by the plane $VKL$, that is, by $FH$ in that plane, Pr. 7.

The construction is exactly the same for the hyperbola.

Fig. 27. In the parabola the plane drawn through the diameter $FH$, passes through $VB$, parallel to $FH$, and it cuts the plane of the base in a chord $DK$, drawn from the point where the determining line $MN$ touches the periphery of the base; in this case draw $KO$, a tangent of the base, intersecting $MN$ in $O$; then, as before, $VO$, drawn to the vertex, is parallel to the plane of the parabola; and all right lines, as $RT$, $PQ$, in that plane, parallel to $VO$, are ordinarily applied to the diameter $FH$, Pr. 7.

Fig. 25, 21, 22. and 23. In all the conic sections, when the plane drawn through the vertex of the cone, and a diameter $PQ$, cuts the plane of the base in a diameter of the base $AB$; then all right lines, as $RT$, in the plane of the section, drawn parallel to the determining line $MN$, are ordinarily applied to the diameter $PQ$. For, if a diameter of the base be drawn parallel to $MN$, that diameter will be parallel to $RT$, and perpendicular to the diameter $AB$; therefore $RT$ is bisected by the plane $VAB$, that is, by $PQ$, the diameter of the section in that plane, Pr. 6.

Prop. XVIII.

Tangents drawn from the vertices, of a diameter of an ellipse, or of a transverse diameter of a hyperbola, are parallel to one another; but tangents of a conic section, drawn from the vertices of two different diameters, are not parallel.

Let a right line be ordinarily applied, to a diameter of an ellipse, or to a transverse diameter of a hyperbola, Pr. 17; and the tangent of the curve at either vertex of the diameter is parallel to that right line; consequently, the two tangents at the extremities of the diameter are parallel to one another.
And because a right line ordinarily applied to one diameter of a conic section is not ordinarily applied to another diameter; therefore a tangent at a vertex of one diameter is not parallel to a tangent at a vertex of another diameter.

Cor. If there be two parallel tangents of an ellipse, or of opposite hyperbolas; these tangents are drawn from the extremities of a diameter of the ellipse, or of a transverse diameter of the hyperbolas.

Prop. XIX. Fig. 23.

A straight line terminated both ways by the curve of a conic section, and parallel to a tangent, is ordinarily applied to the diameter drawn through the point of contact.

Let RT, terminated by the curve of a conic section, be parallel to a tangent of the curve, and through the point of contact. Draw P Q, ordinately applied to F H, Pr. 17. Then P Q is parallel to the tangent F M, Cor. 1. Pr. 15; therefore P Q is also parallel to R T. Consequentially, R T is ordinately applied to F H, Pr. 15.

Fig. 29.

A straight line G T, drawn from the centre of opposite hyperbolas so as to be parallel to F O and H I lines touching the curves at the vertices of a transverse diameter F H, bisects all lines, as R S, terminated by the opposite hyperbolas and parallel to the transverse diameter: and if a transverse diameter, F H, be drawn parallel to a straight line, as R S, terminated by opposite hyperbolas, and bisected by a line G T drawn through the centre, this line is parallel to F O and H I the tangents at the vertices of the transverse diameter.

Draw the diameter R P, join S, P, and produce F H to E P in Q. Because R S is parallel to F H, and R G = G P; therefore S Q = Q P; therefore S P is parallel to H I or F O, Cor. 1, Pr. 16. But G T is parallel to F O or H I; therefore G T is parallel to S P; therefore it is manifest that G T bisects R S, 2, 6, E.

Again, if G T bisects R S, then is G T parallel to H I or F O; for, because R T = T S, and R G = G P, therefore G T is parallel to S P, 2, 6, E. And because F H is parallel to R S, therefore S Q = Q P, 2, 6, E.; therefore S P is parallel to H I, Cor. 1, Pr. 16. Therefore G T is parallel to H I or F O.

Def. XV. Let the determining line M N (fig. 30.) of two opposite hyperbolas cut the periphery of the base of the cone in M and N, and let tangents of the base be drawn from these points (which tangents will pass through the point E when M N does not pass through the centre of the base of the cone, Lem. 4; but they will both be parallel to the diameter A B and to the line V G, when M N does pass through the centre): through the line V G, and the two tangents P M and Q N, let two planes be drawn cutting the plane of the hyperbolas in the lines G P and G Q, intersecting in the centre of the hyperbolas: then these lines are called asymptotes of the hyperbolas.

Cor. 1. The asymptotes do not meet the hyperbolas.

For the planes V P M and V Q N meet the conic surfaces only in the lines V M and V N produced, Pr. 4; therefore the lines G P and G Q, in these planes, are without the conic surfaces in which the hyperbolas are.

Cor. 2. The asymptotes G P and G Q are parallel to V M and V N, the lines in which the planes V P M and V Q N touch the conic surfaces.

For the plane V P M cuts the plane of the hyperbolas and the plane V M N (which are parallel planes) in the lines G P and V M; and the plane V N Q cuts the same planes in the lines G Q and V N.

Cor. 3. If a line be drawn parallel to one of the asymptotes through a point in one of the hyperbolas, that line does not meet the same hyperbola, nor the opposite one, again in another point.

For a line parallel to one of the asymptotes is parallel to one of the lines V M and V N in the conic surface; therefore it does not meet either of the conic surfaces again in another point, Pr. 3.

Cor. 4. A straight line in the plane of the hyperbolas, as F H, drawn through the centre of the hyperbolas within the angle contained by the asymptotes, will meet both the hyperbolas.

Because the asymptotes are parallel to V M and V N, therefore, if V O be drawn parallel to F H, it will be within the angle M V N; and it is plain that F H, parallel to V O, meets both the conic surfaces.

Lemma VII. Fig. 31.

Let A B and A C be two right lines that meet one another, then if B C, drawn through D, and terminated by A B and A C, be bisected in D, no other straight line, terminated by A B and A C, and drawn through D, will be bisected in that point.

Draw G H through D, and E F parallel to A C; because B D = D C, therefore A E = E B, 2, 6, E. Therefore A E and E G are not equal to one another: and, consequentially, G D and D H are not equal.

Prop. XXI. Fig. 32.

If a straight line, terminated by the asymptotes, as K L or S T, touch either of the hyperbolas, it is bisected in the point of contact: and if the middle point of a straight line, as K L or S T, terminated by the asymptotes be in either of the hyperbolas, that line is a tangent of the curve. Draw the diameter F H and let a b be ordinately applied to it, Pr. 17; also draw d e, between M V and V N, parallel to a b. Conceive a plane to be drawn through V G and F H, and let this plane cut the plane M V N in the line V O. It is manifest that V O is parallel to the diameter F H, 16, 11, E. And because a plane drawn through V G bisects a b, the same plane will bisect all right lines in either of the opposite cones that are parallel to a b, Cor. 9; therefore it will bisect d e; that is, d o = o e. Because K L is a tangent, it is parallel to a b, Cor. 1, Pr. 16, and, consequently, to d e. And because the asymptotes are parallel to V M and V N, Cor. 2. Def. XV., and F H is parallel to V O, and d e to K L, it is plain that K L and d e are similarly divided in H and O; therefore K H = H L.

Again, if K L meets the hyperbola in H, and is bisected there, it is a tangent. For, if not, then, a line being drawn between the asymptotes to touch the hyperbola in H, it would likewise be bisected in H as has already been shown: which is absurd. Lem. 7. Therefore K L is a tangent.

Prop. XXII. Fig. 32. Plate V.

If a right line, that cuts an hyperbola or opposite hyperbolas, likewise cuts both the asymptotes; the segments between the hyperbola, or hyperbolas, and the asymptotes, will be equal.

Let the right line D E cut a hyperbola in S and P, and the asymptotes in D and E: draw the transverse diameter F H to bisect S P, and let K L be drawn to touch the hyperbola in H, because F H bisects S P, therefore S P is parallel to the tangent K L, Cor. 1, Pr. 16, but K L is bisected in G.
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in H, Pr. 21: therefore D E, parallel to K L, is bisected in Q, and because D E and S P are both bisected in Q, therefore D S and S E are respectively equal to S P and P D.

Next let S R cut the two opposite hyperbolas in S and T; and the asymptotes in N and I; draw G T through the centre to bisect S R; and draw the transverse diameter F H parallel to S R, and let K L touch one of the hyperbolas at H, and draw K M parallel to S R; because G T bisects S R parallel to G H, therefore G T is parallel to K L, Pr. 20; because K M and F H are both parallel to S R, therefore they are parallel to one another: but K L is bisected at H, Pr. 21, therefore L M is bisected at H, and K M is bisected at O, 2. 6. E; therefore N I, parallel to K M, is bisected at T. And, because S R and N L are both bisected at T, therefore the segments S N and N R are respectively equal to the segments R I and I S.

Prop. XXIII. Fig. 32.

The curve of an hyperbola approaches the nearer to the asymptote the farther it is continued; and, if continued far enough, the distance of the curve from the asymptote will become less than any assigned distance how small soever.

Assume any point, as A in the hyperbola, and draw A X parallel to the asymptote G C; then A X does not meet the hyperbola again, Cor. 3. Def. XV: through A draw any line B C to a point, as Z in the curve, and let B C meet the asymptotes in B and C, and draw B X perpendicular to A X, and Z Y perpendicular to the asymptote G C: because A B = Z C, Pr. 21, it is plain that B X = Z Y; now the more distant the point Z is, the nearer is the line A B to the line A X, and the less is B X, or Z Y the distance of the curve from the asymptote. And because A B may be drawn so as to make B X less than any assigned line, therefore a point of the curve may be found that shall be nearer to the asymptote than any assigned distance.

Definitions.

Fig. 30. Plate IV. XVI. If a straight line be drawn through the centre of opposite hyperbolas parallel to the tangents S T and K L at the vertices of a transverse diameter F H, and a part of that line bisected in the centre, as 1 R, be taken equal to the segments S T and K L (it is plain that S T = K L) of the tangents terminated by the asymptotes; then 1 R is called a second diameter of the hyperbolas, and the extremities of it are called the vertices of the second diameter.

But the word diameter is often used to signify a straight line drawn through the centre of an ellipse or opposite hyperbolas, without regard to the magnitude of such line.

XVII. A straight line, terminated by two opposite hyperbolas and bisected by a second diameter, is said to be ordinarily applied to that diameter; or it is called a double or conjugate diameter, and the half of it, an ordinate.

XVIII. Two diameters of an ellipse, or of opposite hyperbolas, that are mutually parallel to the ordinates of one another, are called conjugate diameters, or they are said to be conjugate to one another.

Prop. XXIV.

If a diameter of an ellipse, or of opposite hyperbolas, be parallel to the ordinates of another diameter, these two are conjugate diameters.

The demonstration of this proposition, in the case of the hyperbola, is manifest from Prop. 20th; for the ordinates 1 of a transverse diameter of a hyperbola are parallel to a tangent at a vertex of the diameter, Cor. 1, Pr. 16.

Fig. 33. Plate V. In the ellipse, let the diameter E D be parallel to P Q. S an ordinate of the diameter F H; draw the diameter P R and joyn S R cutting E D in T. Because P Q = Q S, and PG = GR; therefore S R is parallel to F H. And because E D is parallel to P Q, and S P = PG = GR; therefore R T = T S. Therefore RS is an ordinate of the diameter E D, Def. XVIV, and it is parallel to F H; therefore E D, &c. F H are conjugate diameters, Def. XVIII.

Cor. If a diameter of an ellipse, as E D, be parallel to F O, a tangent at a vertex of another diameter F H; then F H is parallel to D I, a tangent at a vertex of E D.

For a tangent at a vertex of a diameter is parallel to the ordinates of that diameter.

Def. XIX. When a straight line drawn through a point, situated within or without a cone, meets one, or both, of the conic surfaces in two points, it is called a secant: and the two parts of such a line, between the point through which it is drawn and the conic surface or surfaces, are called the segments of the secant. And when a line, drawn from a point without a cone, touches one of the conic surfaces; that part of the line between the point from which it is drawn and the conic surface is denoted by the word tangent in the following propositions.

Prop. XXV. Fig. 34, 35, and 36.

If a straight line be drawn from the vertex of a cone to a point, as B, in the plane of the base, but not in the periphery of the base; and, through any point, as P, situated without or within the cone, another straight line, parallel to the former, be drawn to cut or touch the conic surface, or opposite surfaces; then the square of the line drawn from the vertex of the cone to the point B is to the rectangle under the segments of the secant, or to the square of the tangent, drawn from the point P, as the rectangle under the segments of any line drawn from B to cut the base of the cone, is to the rectangle under the segments of any line, parallel to the base of the cone, drawn through the point P, to cut the conic surface.

Fig. 34. Let the point B be without the base of the cone, and let Q R, drawn through P without or within the conic surface, be parallel to V B, and let it cut the conic surface in Q and R: through P and the line V B draw a plane cutting the conic surface in the lines V G and V H, and the plane of the base in the line B G H; and through P draw L K parallel to G H. Because V B and P Q R are parallel, therefore the plane P Q R is contained in the plane B V P; 7. 11. E; and the points Q and R are in the lines V H and V G, the common sections of the plane and the conic surface. Because Q P is parallel to V B and L K to G H, therefore the triangle Q P L is equiangular to the triangle V B H, and the triangle P K R to the triangle V G B: therefore 4. 6. E.

V B: F R :: B G : P K
V B: P Q :: B H : P L

Consequently, V B :: P R x P Q :: B G x B H :: P K x P L. 23. 6. E. But the rectangle B G x B H is equal to the rectangle under the segments of any other line drawn from B to cut the base of the cone, 35 and 36. 3. E; and the rectangle P K x L K is equal to the rectangle under the segments of any other line, parallel to the plane of the base, drawn from P to cut the conic surface, Cor. Pr. 5; and hence the proportion is manifest in this case.

Fig. 35. And if the point B be within the base of the cone, and a straight line (as P Q R), parallel to the line V B,
conic sections.

V B that joins the point B and the vertex of the cone, be
drawn to cut the opposite surfaces through a point P situ-
ated without or within the cone: the proposition may be
demonstrated in this case, in the very same words as in the
former case.

Fig. 36. And if the point P be without the cone as
well as the line V B, and P S, parallel to V B, be drawn
to touch the conic surface, instead of cutting it; then
the plane P V B will meet the conic surface in a line V S M;
and E M will touch the base of the cone, and P N, parallel
to B M, will touch the conic surface. And because the
two triangles S P N and V B M are equiangular, there-
fore,

V B : P S :: B M : P N
And V B : P S :: B M : P N²

But B M² is equal to the rectangle under the segments of
any line drawn from B to cut the base of the cone; and
P N² is equal to the rectangle under the segments of any
line, parallel to the base of the cone, drawn from P to cut
the conic surface; and hence the proposition is manifest in
this case also.

Prop. XXVI. Fig. 37.

If a point be assumed without or within a cone, and two
lines be drawn through it to meet a conic surface, or oppo-
site surfaces, and so as to be parallel to two straight lines
given by position; then the rectangle under the segments of
the focent, or the square of the tangent, parallel to one of
the lines given by position, has to the rectangle under the
segments of the focent, or to the square of the tangent, pa-
allel to the other line given by position, a ratio that is
constantly the same, wherever the point (from which the
lines are drawn) is assumed within or without the cone.

Fig. 37. Let V B and V C be two straight lines, drawn
from the vertex of a cone to the plane of the base, and given
by position (or parallel to lines given by position); and let
P Q and M N be two straight lines drawn through any
assumed point, as R, to cut the conic surface, and so as to
be respectively parallel to C V and V B: and as C V² is
to the rectangle C K × C L (contained by the segments of
any line drawn from C to cut the base of the cone), so let
D, any assumed line, or magnitude, be to E; and as
C V² is to B G × B H (the rectangle contained by the segments of any line drawn from B to cut the base of the cone), so let F be to E; and draw S T parallel to the base
of the cone through the point R; then, Pr. 24.

(C V² : C K × K L, or) D : E :: P R × R Q : S R
× R T, and B V² : B G × G H; or) F : E :: M R ×
R N : S R × R T.

Therefore inverting and ex æquo,

D : F :: P R × R Q : M R × R N.

And, as the same reasoning applies wherever the point
R is assumed, therefore the ratio of the rectangles P R × R Q,
and M R × R N is the same with, or equal to, the conical
ratio of D to F, wherever the point R is assumed.

And, in like manner, may the proposition be demon-
strated in all other cases, or in all positions of the lines P Q,
and M N, whether they cut, or touch, the same or oppo-
site surfaces.

Prop. XXVII. Fig. 38.

If a point be assumed in the curve of an hyperbola, and
a straight line be drawn through it to cut both the asymp-
totes; the rectangle, contained by the segments intercepted
between the point in the curve and the asymptotes, will be
equal to the square of the semidiameter to which the straight
line is parallel.

First, let the straight line E M N, drawn through E in
the curve of a hyperbola and cutting the asymptotes in M
and N, be parallel to the transverse diameter, G H; join
H E, and produce it to meet the asymptotes in R and S: it
is obvious that the triangle R G H is equiangular to the
triangle R E N, and the triangle G H S to the triangle
S H E; therefore, 4. 6. E.

NE : E R :: G H : H R
S H : G H :: S E : E M

And, because S H = E R, and S E = H R, Pr. 22.

therefore,

ex æquo NE : E R :: G H : E M
consequently, M E × E N = G H², 17. 6 E.

Next, when the line is parallel to a second diameter. And
if it touch the curve at the point H through which it is
drawn, as K L; then the two segments, K H, and H L, are
equal to one another, Pr. 13, and to the semidiameter G P,
which K L is parallel, Def. XVI: whence the proposition
is manifest. But if a line, as D F, drawn through the point
of the curve, E, parallel to the second diameter G P, do
not touch the hyperbola, let K L, parallel to G P, touch
the hyperbola in H, and join H E, cutting the asymptotes
in R and S. Because K L and D F are parallel (be-
ing, both, parallel to G P), therefore the triangles, R H L,
and K H S, are respectively equiangular to the triangles
R E F and D E S; therefore,

F E : E R :: H L : H R
S H : H R :: S E : E D

And, because S H = E R and S E = H R, therefore,

ex æquo F E : H K :: H L : E D


Cor. If any number of straight lines, all parallel to one
another, meet the two asymptotes and the hyperbola or op-
posite hyperbolas; the rectangles contained by the segments
of the parallels, intercepted between the asymptotes and
the curve, will be all equal to one another.

For each of the rectangles is equal to the square of the
semidiameter drawn parallel to the lines.

Prop. XXVIII. Fig. 38.

If a point be assumed without or within a conic section,
and two straight lines be drawn through it to cut or touch
the section or opposite sections, and so as to be parallel
to two lines given by position; then the rectangle under the
segments of the section, or the square of the tangent, pa-
allel to one of the lines given by position, will have to the
rectangle under the segments of the section, or to the square
of the tangents parallel to the other line given by position,
a ratio that is always the same, wherever the point (through
which the lines are drawn), is assumed within or without the
section. And in the ellipse and hyperbola, or opposite
hyperbolas, the conical ratio is equal to that of the squares
of the diameters drawn parallel to the lines given by po-

For sections and tangents of a conic section are sections
and tangents of a conic surface, and thus the first part
of this proposition is included in proposition 25.

And because the diameters of an ellipse intersect in the
centre, and are bisected there; Pr. 14; therefore the ratio of
the rectangles under the segments of the sections, is, in this
case, the same with the ratio of the squares of the semi-
diameters, or the same with the ratio of the squares of the diam-

eters themselves: and thus the second part of the propo-
sition, in as much as it regards the ellipse, is manifest from
the first part.

It remains to demonstrate the second part of the propor-
tion in the case of the hyperbola. Assume any point, as F,
(fig. 28.), in one of the asymptotes, and through F draw

B I
B 1 and C E (terminated by the hyperbola, or opposite hyperbolas), parallel to the semidiameters G P and G H; and let B 1, and C E, or these lines produced, cut the other asymptote in D and A. Because B A = F I, Pr. 22; therefore B F \times F I = B F \times B A = G H^2; and, in like manner, E F \times F C = D C \times C F = G P^2, Pr. 27. Therefore the ratio of the squares of the semidiameters G H and G P, or the ratio of the squares of the diameters themselves, is equal to the ratio of the rectangles E F \times F I and E F \times F C.

And because the ratio of the rectangle B F \times F I to the rectangle E F \times F C is equal to the ratio of the rectangles under the segments of any lines terminated by the curve or curves that intersect one another, and are parallel to B F and F C (the squares of the tangents being taken when the lines touch the curve instead of cutting it), therefore, in the case of the hyperbola also, the second part of the proposition is manifest from the first part.

Cor. 1. If two tangents be drawn to an ellipse, or a hyperbola, or opposite hyperbolas, from the same point, then these tangents are proportional to the diameters, or semidiameters, drawn parallel to the tangents.

For the squares of the tangents are proportional to the squares of the diameters.

Cor. 2. If a right line be ordinately applied to a diameter of an ellipse, or to a transverse diameter of a hyperbola; then the square of the diameter is to the square of the conjugate diameter, so is the rectangle contained by the abscissae of the diameter, between the vertices and ordinate, to the square of the ordinate.

For the double-ordinate is bisected by the diameter, and it is parallel to the conjugate diameter.

Prop. XXIX. Fig. 39.

If an ordinate be drawn to a second diameter of opposite hyperbolas; the square of this second diameter is to the square of the conjugate diameter, as the sum of the squares of the second diameter, and of the part of it between the centre and the ordinate, is to the square of the ordinate.

Let P Q (fig. 39.) be a second diameter of two opposite hyperbolas, and F H the diameter conjugate to it, and let M O be an ordinate to P Q; draw M N parallel to P Q; then M N will be an ordinate of the diameter F H; Def. XX.

Therefore, G H^2 : G P^2 :: F N \times N H, or G N^2 - G H^2 : M N^2, Cor. 2. Pr. 27;

therefore G H^2 : G P^2 :: G N^2, or M O^2;

G P^2 + M N^2 :: M O^2.

Prop. XXX. Fig. 40.

If a right line, as P T, drawn through a point P in the surface of a cone so as to be parallel to a right line V B contained in the cone, and S be the point in the plane of the base in line B A; and, through R and S, draw M N and H G parallel to A B. Because P T is parallel to V B and R N to S G, therefore R N G S is a parallelogram; and R N is = G S. It is obvious that the triangles P M R and P H S are equiangular: therefore P R is to P S as M R is to H S, 4. 6. E, or as M R \times R N is to H S \times S G, 1. 6. E. But M R \times R N and H S \times S G are respectively equal to the rectangles contained by the segements of any two lines, parallel to the base of the cone, drawn through R and S to cut the conic surface, Cor. Pr. 5; and hence the proposition is manifest, when P T meets two lines parallel to the plane of the base.

And if P T meet two parallel lines D E and I K, not parallel to the plane of the base; then, let the same construction be made as before; and because D E is parallel to I K, and M N to G H; therefore, DR \times RE : MR \times RN :: IS \times SK :: HS \times SG;

Alternando, DR \times RE :: IS \times SK :: MR \times RN :: HS \times SG. Therefore, as is obvious from what has already been shown,

P R : P S :: DR \times RE :: IS \times SK.

And if S be without the cone and the line drawn through it touch the conic surface instead of cutting it, the reasoning is still the same, when the square of the tangent is taken in place of the rectangle under the segments of the fectant.

Prop. XXXI.

If two points be assumed in the diameter of a parabola, or in a right line drawn through a point in the curve of an hyperbola parallel to one of the asymptotes, and two parallel lines be drawn from these points to cut, or touch, the curve or opposite curves; then, as the rectangle under the segments of the fectant or the square of the tangent, drawn from one of the assumed points, is to the rectangle under the segments of the fectant, or to the square of the tangent, drawn from the other assumed point, so is the segment of the diameter of the parabola, or of the line parallel to the asymptote, between the first assumed point and the curve, to the segment of the same line between the second assumed point and the curve.

Because all the diameters of a parabola, Def. XIII. and all the straight lines drawn parallel to an asymptote of a hyperbola, Cor. 2. Def. XV. are parallel to a right line contained in the conic surface; and because fectants, and tangents of a parabola, or a hyperbola, are fectants and tangents of a conic surface; therefore it is manifest that this proposition is included in the last proposition.

Cor. The squares of the ordinates drawn to a diameter of a parabola are proportional to the abscissae of the diameter between the ordinates and the vertex.

Fig. 43. For the double ordinates of a diameter of a parabola, as G F D and L K E are parallel to one another; Cor. Def. XVII. therefore, by this proposition.

G F \times F D, or G F^2 :: L K \times K E, or L K^2 :: A F : A K.

Prop. XXXII. Fig. 41, 42, and 43.

If an ordinate be drawn to a diameter of a conic section, which is not a second diameter of a hyperbola: then, in the ellipse, the square of the ordinate is equal to a rectangle contained by an abscissa of the diameter and a constant line, deficient by a rectangle similar to that contained by the constant line and the diameter; and, in the hyperbola, the square of the ordinate is equal to a rectangle contained by an abscissa of the diameter and a constant line, exceeding by a rectangle similar to that contained by the constant line and the diameter: and in the parabola, the square of the ordinate is equal to a rectangle contained by the abscissa of the diameter and a constant line.

Let A B (fig. 41 and 42.) be a diameter of an ellipse, or a transverse diameter of a hyperbola, F G an ordinate of it, and D E the conjugate diameter; draw A H perpendicular to A B and equal to a third proportional to A B and D E.
and join BH: draw FL parallel to AH, and complete the parallelograms AK, FN and AM. It is obvious that BA is to AH as BF is to FL, 4. 6. E., or as BF \times FA is to FL \times FA or the rectangle FN, 1. 6. E. And because AH is a third proportional to BA and ED, therefore, 

\[ B : A : H :: B^* : D^2, \] 

Cor. 2. Pr. 28.

Therefore, 

\[ AF \times FB : FG^* :: AF \times FB : rect. FN, 14. 5. E. \]

And, FG \^2 = rect. FN. Now, in the ellipse, the rectangle FN is deficient from the rectangle AM, contained by the absciss AF and the line AH (which is the same for all the ordinates) by the rectangle NM, similar to the rectangle AK, contained by AH and AB; and, in the hyperbola, the rectangle FN exceeds the rectangle AM by the rectangle NM, similar to the rectangle AK.

In the parabola, let one ordinate of a diameter be pitched upon, as \( LK \), and take AH, a third proportional to the absciss AK and the ordinate \( LK \); then, if \( FG \) be any other ordinate, 

\[ LK^2 : FG^2 :: AK : AF, (Cor. Pr. 31) :: AK \times AH : AF \times AH. \]

And because \( LK^2 = AK \times AH \), therefore \( FG^2 = AF \times AH \), the rectangle contained by the absciss \( AF \) and the line \( AH \), which is the same for all the ordinates of the diameter.

Def. XX. The conical line \( AH \) is called the parameter of the diameter \( AB \); and, in the ellipse and hyperbola, it is a third proportional to the diameter \( AB \), and the conjugate diameter \( DE \); but, in the parabola, it is a third proportional to the absciss of any ordinate of a diameter, and the ordinate itself.

Scholium.

The phrases "deficient" and "exceeding by a rectangle similar to another rectangle," occur in Euclid's Elements, 27 and 28. 6. E., although they are now generally diffused by geometers; and, it must be confessed, they are far from expressing the meaning they are intended to convey, in a simple and perspicuous manner. These expressions have been used in enunciating this proposition, with the view of drawing the attention to the distinguishing circumstances from which the several conic sections derive their names. For Apollonius gave the name of the ellipse to one of these curves, on account of the defect of the square of the ordinate from the rectangle contained by the absciss and the parameter; and he called another of them a hyperbola, from the excess of the square above the same rectangle; and the third a parabola, on account of the exact equality of the same two spaces.

Prop. XXXIII. Fig. 44. Plate VI.

Let a scalicene cone be cut by a plane perpendicular to the plane of the base, making the triangular section \( VAB \); and let \( IE \) be the line found in the last proposition; also, let the cone be cut by a plane, making an elliptical section, \( P : F \); \( Q \); \( H \), the determining line of which, \( MN \), is parallel to the line \( IE \); and let \( FH \) be the diameter of the section that is parallel to \( MN \). Then, if \( MN \) fall between the base of the cone and \( IE \), \( FH \) is the least diameter of the section; and, if \( MN \) fall upon \( IE \), all the diameters of the section are equal to \( FH \) and to one another; and if \( FH \) fall on the opposite side of \( IE \) to the base of the cone, \( FH \) is the greatest diameter of the section.

Let \( RS \) be any diameter of the section different from \( FH \), and draw \( VK \) (meeting \( MN \) in \( K \)) parallel to \( RS \); and let \( KL \) cut the base of the cone. Because \( RS \) and \( FH \) are bisected in the centre \( G \), therefore, 

\[ RG^2 : HG^2 :: VK^2 : KL \times KT, Pr. 25. \]

Now, if \( MN \) fall between the base of the cone and \( IE \), then \( VK^2 \) is greater than \( KT \times KQ, Pr. 33 \); therefore \( RG \) is greater than \( HG \); and, in this case, \( FH \) is the least diameter of the section.

And, if \( MN \) fall upon \( IE \), then \( VK^2 = KT \times KL \); therefore \( KG = HG \); and, in this case, the section is a circle.

And, lastly, if \( MN \) be on the other side of \( IE \) to the base, then \( VK^2 \) is less than \( KT \times KL \); therefore \( RG \) is less than \( HG \); and, in this case, \( FH \) is the greatest diameter of the section.

Cor. 1. If a section of a cone, not parallel to the plane of the base, be a circle, then \( IE \), the line found in Prop. 32, is the determining line of that section.

For \( RG^2 : HG^2 :: VK^2 : KT \times KL. \)

And,
And, because the section is a circle, therefore $RG = HG$; therefore $KV = KT \times KL$; therefore $K$ is a point in the line $IE$, Cor. Pr. 32. And, in like manner, it may be shown that every point of the determining line of the section is in the line $IE$.

Cor. 2. Let $PQ$ be the common section of the plane $VAB$, and the plane of the ellipse; then $PQ$ is a diameter of the ellipse. It is manifest that $MN$ is perpendicular to the plane $VAB$; therefore $FH$, parallel to $MN$, is perpendicular to the same plane and to $PQ$. Also $PQ$ and $FH$ are conjugate diameters, Pr. 17. Therefore, when the plane $VAB$ is perpendicular to the plane of the base, $FB$, the diameter of the ellipse, parallel to the base of the cone, cuts its conjugate diameter, $FP$, at right angles.

**Scholium.**

If $FPQH$ be a section of the cone, of which $IE$ is the determining line, it is plain that $PQ$ is parallel to $VD$; therefore, the angle $VQP = angle VBD = angle VAB$. Therefore, the triangle $PVO$ is similar to the triangle $BAV$; but the angles at the base of the one triangle have a sub-contrary position to the equal angles at the base of the other triangle. For this reason a section of a cone that has the line $IE$ (found as in Prop. 32.) for its determining line, is called a sub-contrary section.

The word ellipse has hitherto been used to denote, generally, those sections of a cone which have their determining lines without the base of the cone; but, as it has been shown that the conic section is a circle in one particular case (viz. the sub-contrary section) included in this general definition, precision requires that the term ellipse be hereafter restricted in its signification, so as to exclude that particular case.

**Prop. XXXV. Fig. 46.**

An ellipse being given, it is required to draw a diameter of it that shall be equal to $FH$, the diameter which is parallel to the base of the cone; but the plane $VAB$, drawn through the vertex of the cone, and that diameter of the base which is perpendicular to the determining line of the ellipse, must not be perpendicular to the plane of the base of the cone.

Draw the line $IE$, as in proposition 32. And because $IE$ and $MN$ are perpendicular to two different diameters of the base of the cone, they are not parallel; let them meet in $K$, and draw $VK$, and the diameter $RS$ parallel to $VK$; then $FH = RS$. For, because $RS$ and $FH$ are bisected in the centre $G$, therefore $V^2 = KT \times KL$; $FG^2 = RG^2$, Pr. 24. But $V^2 = KT \times KL$; therefore, $FG = RG$.

Cor. Only one diameter can be drawn that shall be equal to $FH$.

For, if $FH = RS$, then $V^2 = KT \times KL$; therefore, $K$ is in the line $IE$; and $IE$ can meet $MN$ only in one point.

**Def. XXI.** A diameter of a conic section, that cuts its ordinates at right angles, is called an axis.

Cor. Because two conjugate diameters of an ellipse, and opposite hyperbolas, cut the ordinates in the same angles, Pr. 24.; therefore, if these become axes of these curves, there will necessarily be two; and these will be conjugate diameters, and they will cut one another at right angles.

**Prop. XXXVI. Fig. 47 and 48.**

An ellipse has only two axes.

Let $FH$ (fig. 17.) be the diameter of the ellipse drawn parallel to the base of the cone; and, first, let $FH$ be the greatest or the least diameter of the ellipse, Pr. 34.; then, it has already been shown, that $FH$ cuts its conjugate $PQ$ at right angles, Cor. 2, Pr. 34.; and, therefore, $FH$ and $PQ$ are axes of the ellipse, Cor. Def. XXI. Also they are the only axes of the ellipse.

For, let $XY$ be any other diameter, then $XY$ is not perpendicular to $FI$; draw $FZO$, cutting the ellipse again in $O$ perpendicular to $XY$, and draw $GO$. Because $FH$ is the greatest or least diameter of the ellipse; therefore, $FG$ is not equal to $GO$; therefore, $FZ$ is not equal to $ZO, 47.1. E$. Therefore $FO$, perpendicular to $XY$, is not an ordinate of $XY$; therefore, $XY$ is not an axis.

Secondly, when $FH$ is not the greatest or least diameter of the ellipse, draw the diameter $RS$ equal to $FH, Pr. 35.$; and draw the diameter $LK$ and $DE$ to bisect the angles contained by $FH$ and $RS$; join $FS$. And, because $LK$ bisects the angle at the vertex of the isosceles triangle $FGS$, it will bisect the base $FS$, and will cut it at right angles. And because $LK$ cuts $FS$, one of its ordinates at right angles, therefore $LK$ is an axis; and, it is plain, that $DE$, parallel to $FS$, is another axis and the conjugate of $LK$. Also, $LK$ and $DE$ are the only axes of the ellipse.

For, let $XY$ be any other diameter; then $XY$ is not perpendicular both to $FH$ and to $RS$; let it be not perpendicular to $FH$, and draw $FZO$ (cutting the ellipse again in $O$) perpendicular to $XY$, and join $GO$. Because $RS$ is the only diameter of the ellipse that is equal to $FH$, Cor. Pr. 35.; therefore $FG$ is not equal to $GO$; therefore $FZ$ is not equal to $ZO$. And because $FO$, perpendicular to $XY$, is not an ordinate of $XY$, therefore $XY$ is not an axis.

**Prop. XXXVII. Fig. 49.**

A hyperbola has only two axes.

Let $GF$ and $GK$ be the asymptotes of the hyperbola, and draw the transverse diameter $GA$ to bisect the angle of the asymptotes, and the second diameter $DE$ to bisect the adjacent angle; let $FK$, drawn between the asymptotes, be perpendicular to $GA$, and meet the hyperbola in $M$ and $N$. Because $FK$ is perpendicular to $GL$, and the angle $FGL = angle KGK$, therefore $FL = 26.1. E$. But $FM = NK, Pr. 22.$; therefore $ML = LN$. Therefore, $MN$ perpendicular to $GA$, is an ordinate of $GA$; therefore, $GA$ is an axis; and $DE$, parallel to $MN$, is the conjugate of $GA$, and another axis, Pr. 54.

And if $GA$ do not bisect the angle $FAG$, then $FK$, perpendicular to $GA$, will not be bisected in $L$; therefore $ML$ will not be equal to $LN$; therefore, in this case, $MN$, perpendicular to $GA$, is not an ordinate of $GA$. Therefore, the hyperbola has no axes besides $GA$ and $DE$.

**Prop. XXXVIII. Fig. 50.**

A parabola has only one axis.

Let $OS$, terminated by the curve, be perpendicular to any diameter, and draw the diameter $PQ$ to bisect $OS$; and, because all the diameters of the curve are parallel, therefore, $PQ$ is perpendicular to $OS$, and an axis of the curve, Def. XXI. And because $OS$ can be an ordinate of only one diameter, therefore there is only one axis.

**Prop. XXXIX. Fig. 51 and 52.**

The two axes of an ellipse are always unequal; and the greater axis is the greatest diameter, and the least the least diameter of the curve. And that axis of a hyperbola, which is a transverse diameter, is the least of all the transverse diameters.
CONIC SECTIONS.

Let A B and D E (fig. 51) be the two axes of an ellipse, C the centre, and C H any semidiameter; draw H P perpendicular to A B, and H Q perpendicular to D E. Because A B and D E are conjugate diameters; and H P an ordinate to A B, and H Q an ordinate to D E; therefore,

A B' = D E' = A P × P B = H P, Cor. 2. Pr. 28.

Now, if A B be supposed to be equal to D E, it will follow that A P × P B = H P²; therefore, A P × P B + C P² = H P² + C P², or A C = C H. Therefore, A C = C H; and the ellipse will be a circle, which is not the case, Cor. 1. Pr. 33. Therefore, A B and D E are unequal; let A B be supposed to be greater than D E.

Because A B' is greater than D E', therefore A P × P B is greater than H P²; and A P × P B + C P², or A C, is greater than H P² + C P², or C H'. Therefore the semi-axis A C is greater than any other semi-diameter H C.

In like manner,

D E' = A B' = D Q × Q E = H Q².
Therefore D Q × Q E is less than H Q²; and D Q × Q E + C Q², or C D', is less than H Q² + C Q², or C H'. Therefore the semi-axis D C is less than any other semi-diameter C H.

Fig. 52. In the hyperbola, a tangent of the curve drawn from the extremity of the axis C A, as A T, falls between the centre and the curve; and because C A, the semi-axis, is less than any other line drawn from C to A T, much more is it less than a semi-diameter C H drawn from C to the curve on the other side of A T.

Definition XXII.

The greater axis of an ellipse is called the transverse axis; and the lesser, the conjugate axis; and, in the hyperbola, that one is the transverse axis which is a transverse diameter, and the other is the conjugate axis.

Prop. XL. Fig. 51 and 52.

A diameter of an ellipse nearer the transverse axis is greater than one more remote; and a transverse diameter of the hyperbola nearer the transverse axis is less than one more remote.

Let C K and C H be two semi-diameters of an ellipse; join H K, and draw A G parallel to H K; join C G and draw C I to bisect H K. Because C I bisects H K, it will likewise bisect A G, Pr. 15. And because A M = M G, and A C is greater than C G, therefore the angle A M C is greater than the angle G M C, 25. 1. E.; that is, the angle K L C is greater than the angle H L C. And because H L = L K, therefore K C, nearer to C A, is greater than H C more remote from C A, 24. 1. E.

In the hyperbola, the same construction be made, because A C is less than C G, therefore the angle A M C, or K L C, is less than the angle G M C, or H L C. Therefore C K is less than C H.

Definitions. Fig. 53, 54, and 55.

XXIII. Let A B (fig. 53 and 54.) be the transverse axis, D E the conjugate axis, and C the centre of an ellipse, or hyperbola, or opposite hyperbolas; and let C F and C F' be taken in the transverse axis, such that C F² and C F'² are equal to C A² − C D² in the ellipse, and to C A'² + C D'² in the hyperbola; then the two points F and F' are called the foci of the ellipse, hyperbola, or opposite hyperbolas.

Fig. 55. But the focus of a parabola is a point F in the axis, within the curve, and distant from the vertex by a line equal to one fourth part of the parameter of the axis.

Cor. The distance of each of the foci from either extremity of the conjugate axis is equal to half the transverse axis; and the distance of either of the foci of a hyperbola from the centre is equal to the distance between the extremities of the transverse and conjugate axes.

XXIV. If F (fig. 53 and 54.) be a focus of an ellipse, or hyperbola, or opposite hyperbolas, and A G be taken in the transverse axis (on the opposite side of the vertex to the focus F), such that A F is to A G as C F is to C A; then a line, as H K, drawn through G perpendicular to the transverse axis, is called a director of the ellipse, or hyperbola, or opposite hyperbolas.

Fig. 55. But the director of a parabola is a line, as H K, perpendicular to the axis, drawn through a point G as far distant from the vertex of the axis on the one side as the focus is on the other side.

Cor. An ellipse, hyperbola, or opposite hyperbolas, have two directors; one corresponding to each focus. For the same construction that is made for one focus, may be made for the other focus.

Prop. XLI. Fig. 53 and 54.

Let A B be the transverse, and D E the conjugate, axis of an ellipse, or hyperbola, or opposite hyperbolas; from any point in the curve, or opposite curves, as M, let M C be drawn to the centre, and M P perpendicular to the transverse axis, and take C O, in the same axis, such that C O² may be equal to M C² − C D² in the ellipse, and to M C'² + C D'² in the hyperbola; then as A C is to C F so is P C to C O.

For, because A B and D E are conjugate diameters, therefore,

A C : C D² :: A P × P B : M P², Cor. 2. Pr. 28, therefore, A C : A C + C D² :: A P × P B : A P × P B + M P². But in the ellipse A C − C D² = C F²; and A P × P B − M P² = A C − C D² = M P² = A C − M C = A C − C D² = C F² = C O²; and in the hyperbola, A C + C D² = C F²; and A P × P B + M P² = −PC = A C + M P² = M C − A C = C D² = C A² = C O² = C F². Therefore the last analogy becomes,

A C : C F² :: A C + C D² : C F² + C O²
Consequently A C : C F² : C P² : C O² 19. 5. E.
And A C : C F : C P : C O.

Prop. XLII. Fig. 53 and 54.

If M be a point in an ellipse or hyperbola, and M F and M f be drawn to the foci; then, in the ellipse, the sum of M F and M f is equal to the transverse axis; and, in the hyperbola, the difference of M F and M f is equal to the transverse axis.

Draw M P perpendicular to the transverse axis, and take C O as in the last proposition. And, because

A C : C F : C P : C O, Pr. 41.

Therefore A C × C O = C F × C P, and A C × C O = 4 C F × F O. But, because A B and P F are bisected in C, therefore 4 A C × C O = B O² − A O² = 8 E 2; and, 4 F C × C P = P f² − P F² = M F² − M P², 47. 1. E.; therefore B O² = A O² = M F².

Again, M F² + M f² = P F² + P F² = 2 F C² + 2 C F² + 2 M P² = 2 F C² + 2 M P² = 2 F C'² + 2 M P² = 2 C F'² = 2 C D'² + 2 C O² = 2 A C² + 2 C O² = B O² + A O².

And,
And, because \(BO^2 + AO^2 = FM^2 + MF^2\), and \(BO^2 = AO^2 = fM^2 - MP^2\); therefore, by adding the equals, \(2BO^2 = 2AO^2 = 2FM^2 = 2MP^2\). Therefore \(FM = BO\), and \(FM = AO\); whence the proposition is manifest.

**Prop. XLIII. Fig. 53, 54, and 55.**

A straight line drawn from any point in a conic section to a focus has to a perpendicular drawn to the corresponding direc-tix, a ratio that is constantly the same wherever the point is assumed in the curve; and, in the ellipse, the constant ratio is a ratio of minority (or of a less magnitude to a greater): in the hyperbola, the constant ratio is a ratio of majority (or of a greater magnitude to a less); and, in the parabola, the constant ratio is a ratio of equality.

Fig. 53 and 54. Let \(M\) be a point in an ellipse or hyperbola, and draw \(MF\) to a focus and \(MK\) perpendicular to the directrix \(HG\), which corresponds to that focus; draw \(MP\) perpendicular to the transverse axis and take \(CO\) as in Prop. 41. Then

\[
AC : CF :: CP : CO. Pr. 41.
\]

Invertendo, \(CF : CA :: CO : CP\).

Therefore \(CF : CA :: AO : AP, 15, 5, E\),

But, \(CF : CA :: AP : AG, Def. XXIV.\)

Therefore \(CF : CA :: AO : GP, 15, 5, E\).

But, as has been shown in the demonstration of the last proposition, \(AO = MF\), and \(GP = MK\); therefore

\[
CF : CA :: MF : MK.
\]

But the ratio of \(CF\) to \(CA\) is a constant ratio; and it is a ratio of minority in the ellipse, and a ratio of majority in the hyperbola.

**Fig. 55.** In the parabola, \(GA = AF\), and \(4AF \times AP = MP^2, Def. XXIII.\); but, \(4AF \times AP = GP^2 - PF^2\), 8, 2, \(E\); therefore \(MP^2 = GP^2 - PF^2\); and \(MP^2 + PF^2 = GP^2 = MK^2\). Therefore \(MF = MK\).

Most branches of human learning take their origin from a few detached truths, viewed at first without connexion, and which, in the progress of knowledge, are at length joined together in one body of science. But when a science has risen, by accumulated discoveries, to such a degree of importance as to interest the curiosity of mankind, it is often too late to retrace its history, and to delineate its rise and progress in an accurate and satisfactory manner. It generally happens that the authors of many of the subordinate discoveries have already fallen into oblivion; and that some important improvements are disputed, and ascribed to different inventors by different writers. In reviewing the history of the conic sections, we must add, to the canons which commonly obscure the origin of all the sciences, the very high antiquity of this branch of the mathematics, and the lofs of the early geometers who have written on it. No work of antiquity that professedly treats of the history of the conic sections has reached our time; and there is little to satisfy curiosity in this inquiry, excepting a few incidental notices collected from different authors.

The discovery of the curves, denominated the conic sections, is attributed to the philosophers of the school of Plato; and it is even ascribed, by some authors, to the founder, himself, of that celebrated sect. Other authors, grounding their opinion on a few words in an epigram of Eratosthenes, have given the honour of this discovery to Menæchmus, who lived a little posterior to the time of Plato. But the information derived from ancient writers is too scanty to enable us to decide concerning the original discove-
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ten is eight books, and it was esteemed a work of so much merit by his contemporaries as to procure for its author the title of the great geometer. The purpose of the four first books, as we are informed in the preface epistle to Eudoxus, is to deliver the elements of the science: and, in this part of his work, Apollonius professes only to have collected and methodized what had already been published by former writers. One improvement introduced by him deserves to be particularly mentioned; as it is a curious instance of the progress of the mind in generalizing its first conceptions. The conic sections, according to the definitions now given of them, are such curves as are produced by the common section of a plane and a cone of whatever kind. But the first mathematicians who noticed these curves, did not define them in a way to general. They confined their attention to the right cone only; and, even in this kind of cone, they always supposed the cutting plane to be perpendicular to the slant line. In this view of the matter it is manifest, that the species of the curve would depend on the fort of cone by which it was produced. If the vertical angle of the cone were supposed to be an acute-angle, then the cutting plane, perpendicular to the slant line, would meet one of the conic surfaces only, and the line of common section would form the whole, and would be an ellipse. If the vertical angle of the cone were supposed to be a right-angle, then the cutting plane would still meet only one of the conic surfaces, but the line of common section, not embracing the whole contour of the solid, would, in this case, be a parabola; and, lastly, if the vertical angle of the cone were supposed to be obtuse, then the cutting plane would intersect both the opposite conic surfaces, and the curve produced would be a hyperbola. It is true that the curves, thus defined, were rightly denominated conic sections, considering them as parts of a class; but it did by no means follow that they comprehended all the species of the class. Even retaining the right cone, yet curves of a different nature might possibly be produced merely by varying the inclination of the cutting plane: and much more, if the species of the cone, and the position of the cutting plane, were both changed. To Apollonius belongs the honour of having generalized the ancient definitions of the conic sections, and of presenting the subject in the more perfect form in which it still continues to be taught; and the improvement is equivalent to the discovery that all the possible sections of any cone, are reducible to three distinct species and no more.

Before the time of Apollonius, the names of the several conic sections were likewise different from those that they now bear. In conformity to the ancient definitions of the curves, the ellipse was called the section of an acute-angled cone by the more early geometers: and, in like manner, the parabola, and hyperbola, were denominated the sections of a right-angled, and obtuse-angled, cone. The present names are commonly supposed to have been invented by Apollonius; and, in compliance with the generality of writers, we have noticed the properties from which he derived them. But the received opinion on this point is probably not well founded: for both the terms, parabola and ellipse, occur in the writings of Archimedes, which were prior to the time of Apollonius.

The four first books of the conics of Apollonius is the only part of that work that has come down to us in the original Greek. On the revival of learning, the lovers of the mathematicies had long to regret the loss of the original of the latter part of this important treatise. In the year 1658, Borelli, passing through Florence, found an Arabic manuscript in the library of the Medici family, which he judged to be a translation of all the eight books of the conics of Apollonius. Transported with joy, he had interceded enough to prevail on the Duke of Tuscary to extricate him with the manuscript, which he carried to Rome: and, having procured the assistance of Abraham Ecchederisi, a professor skilled in the Arabic tongue, he published a Latin translation of it in 1661. The manuscript, discovered by Borelli, was entitled, "Apollonii Pergami Libri Octo," and was supposed to be a complete translation of the work of the ancient geometer: but, on examination, it was found to contain the first seven books only. Two other Arabic translations of the conics of Apollonius have been discovered by the industry of learned men: but both of them have the same defect as that found at Florence. From the circumstance of all the three manuscripts agreeing in the want of the eighth book, it is reasonable to suppose that this part of the treatise had already perished when the translations were written: and there is now no room to hope that the loss will ever be recovered. It is not easy to ascertain in what age the original of Apollonius's work disappeared; but we know that the whole of it was extant in the time of Pappus Alexandrinus. In the "Collectiones Mathematicae," this author has given a facsimile account of the contents of all the eight books, and has added the lemmas required for the demonstrations of the propositions they contain: and this circumstance enabled Dr. Halley to annex, to the complete edition of the conics of Apollonius, which he published in 1710, a restoration of the eighth book executed with so much ability as to leave little room to regret the want of the original.

In the four last books of his treatise, Apollonius, as he informs us in the preface epistle, delivers the higher and more abstruse parts of the theory of the conic sections. He here claims the merit of originality, and professes to develop the results of his own researches. And it must be confessed that the genius, invention, and geometrical skill, displayed in this part of his work, are such as fully to justify the honourable appellation bestowed on him by his contemporaries. This treatise must be allowed, even in the present times, to contain a very extensive, if not a complete, theory of the conic sections. This branch of the mathematicies has, perhaps, been more cultivated than any other, since the revival of learning; but the industry of modern mathematicians has discovered few properties of their curves, of which some traces are not to be found in the work of the great geometer. Montucla thus delivers his opinion of the treatise of Apollonius: "Pour donner enfin de l'ouvrage d'Apollonius l'idée qu'il mérite, je remarquerais le grand nombre de son, et qui est un précieux trésor, qui pour le besace de la génération des mathématiciens. Among the number we find the name of the learned Hypatia, the daughter of Theon: and we still possess the lemmas of Pappus Alexandrinus for all the eight books, and the commentary of Eutocius on the four last books. Since the revival of learning, the theory of the conic sections has been much cultivated, and is the subject of a great variety of ingenious works.

3 II 2
There is a relation subsisting between all the parts of human knowledge, which frequently connects speculations the most abstracted, and fome of the most barren, with inquiries that are highly interesting to us, and most fertile in useful consequences. In studying the properties of the conic sections, the followers of Plato sought merely to gratify a contemplative turn of mind. Their researches were chiefly undertaken with the view of resolvering speculative problems; they were directed to no immediate object of practical utility. It excites some degree of admiration, when we reflect that enquiries, purely intellectual, and apparently so little connected with external things, have, in modern times, been employed to explain many of the most remarkable phenomena of the material world. The doctrine of the conic sections is equally useful in the science of optics, and in determining the path of a projectile body. Above all, this branch of mathematics derives its chief importance from the applications that are made of it in modern astronomy.

The uses of the conic sections in physical science have, as it is natural to conjecture, led modern mathematicians to consider these curves under particular points of view suited to their purposes. It is for this reason that the properties of these remarkable points, called foci, have been investigated with so much care in latter times. In optics, these points are almost exclusively the subjects of consideration when the conic sections are concerned; and, in astronomy, the fun invariably occupies one of the foci of the elliptical orbits which the planets and comets describe round him. These points did not entirely escape the penetration of the ancient geometers. Apollonius has anticipated the moderns here, as well as in other parts of this science. He has unfolded many of the most curious properties of the foci, in the ellipse and hyperbola. He treats of them under the appellation of "Puncta ex applicationi facta," which signifies that they are points formed by cutting the transverse axis in the ellipse, and the transverse axis produced in the hyperbola, into two segments containing a right angle equal to the square of half the foci axis; and the phrase is thus equivalent to the modern definitions of the same points. The focus of the parabola is not noticed by Apollonius, nor by any other ancient author; unless, indeed (as has been pointed out to the writer of this article by a friend,) we except a proposition (Theor. 222, Prop. 238.) in the seventh book of the "Collectiones Mathematicae," where Pappus delivers, in the form of a Locus, that beautiful property of the focus, and the corresponding directrix of any conic section, which some modern writers, considering it as characteristical, have made the basis of a definition of the curves in plane. Mydorgius, contemporary with Des Cartes, is the first who treated generally of the foci, of all the conic sections. Since his time the properties of these points have been gradually and fully developed.

Before Dr. Wallis, all the writers on conic sections followed the ancient geometers in making the cone the common origin and foundation of their theorems. That mathematician first entertained the idea of using the conic as little as possible in delivering the elements of the conic geometry; and this plan is pursued in his treatise, published at Oxford in 1655. In support of this innovation, Dr. Wallis urges the probability of Apollonius's work, and the difficulty and perplexed nature of the demonstrations. On the old plan, many propositions respecting the generating of the cone, and the properties of that solid, are to be previously gone through; and the diagrams are rendered confounded by many lines drawn in different planes. On these accounts, he ascertains, that the study of the conic sections was generally neglected: "unde et simile neglecta sibi (conicorum doctrinae), tenuus infacebooki difficilem perspectiva." It must be allowed that the objections of Dr. Wallis are not without foundation. On the other hand, it has been the opinion of some later mathematicians, that the defects of the treatise of Apollonius arise, not from his having made too much use of the cone, but from his having availed himself too little of the assistance to be derived from that solid. They contend that the most general and characteristic properties are first to be sought for in the cone itself; whence they are to be transferred to its sections, as particular cases of more general propositions. The latter, and more approved writers, who have adopted this opinion, are Dr. Hamilton and professor Robison of Oxford. Although Dr. Wallis proposed to introduce the cone as little as possible in delivering the elements of the conic geometry; yet it is to be remarked that he did imitate his predecessors in deriving, from that solid, the fundamental property which he afterwards made the basis of all his reasoning. But the idea, which he introduced, was soon carried further; and treatises on the conic sections were written, in which the cone was entirely laid aside, and the curves were derived from descriptions in their. De la Hire, in his "Nouveaux Elemens des Sections Coniques," published at Paris in 1679, is the first author who successfully treated on the conic sections in this new view of the subject. He derives the description of the parabola from the equality that subsists between two lines meeting in any point of the curve, one of which is drawn to the focus, and the other is perpendicular to the directrix; and he describes the ellipse and hyperbola from the analogous properties, that, in the one, the sum of two lines drawn from any point in the curve to the two foci, and, in the other, the difference of two such lines, are equal to the transverse axes. In these fundamental points De la Hire is followed by most of the later writers, who have treated of the conic sections independently of the cone; and, in particular, by Dr. Simson of Glasgow, who has published an extensive and accurate treatise on this subject. Besides the method of De la Hire, another way of defining the curves in plane has been proposed. It is founded on that general property of the directrix first given by Pappus Alexandria, as we have already noticed above. The learned abbé Bosovich, an excellent Italian mathematician, has drawn his definitions of the curves from this fundamental property in the ingenious treatise on conic sections, published in his "Elementa Mathematica Universelle" and we have two works in our own language, which are founded on the same primary definitions; that of Mr. Newton of Cambridge, and that of Mr. Walker of Nottingham. The doctrine of the conic sections is of great use in physical and geometrical astronomy, and the physico-mathematical sciences. This doctrine has been much cultivated by geometers ancient and modern: and we have many good treatises on the subject; but that published by Mr. Simson, professor of mathematics at Glasgow, deserves to be particularly mentioned, not only for its elegance, but for its geometrical accuracy, which, as he justly remarks in his preface, has not always been so well observed in treatises of this kind, as is ought to be. See also Gregorii a St. Vincenti Opus de Quadratura Circuli, &c. Sectionum Coni; Mydorgius de Sectionibus Conicis; De la Hire de Sectionibus Conicis; Trevigari Elen. Section. Con.; Hamilton's Tract. Geom. de Section. Con.; de l'Hospital's Anal. Treat. of Conic Sections; Muller's Treatise, &c.; Hutton's; and Hallay's edition of Apollonius, &c. Oxon. 1719. fol.

To the properties of the conic sections, mentioned above
above, it may be proper to add the properties of their osculatory circles, or circles of curvature. See **Curvature**.

**Conic sections, similar.** See *Similar.*

**Conic Form of Mountains and Hills.** Too many naturalists have fallen into the mistake, of denouncing mountains or hills which have a conical top, to be of volcanic origin; because, granite sometimes, as Achelous mountain in the Hartz, assumes a conic form, Lopus 17; and porphyry frequently takes this shape. In some rare instances, the rupture of the strata has produced conical hills. See **Elevation of Strata and Volcano**.

**Conica, in Ancient Geography, a town of Aia, in Paphlagonia. Telomy.**

**Conics, that part of the higher geometry, or geometry of curves, which considers the cone, and the several curve lines arising from the sections thereof.**

**Conichthyodontes, or Plectonitis, in Natural History,** one of the three names by which the fossil teeth of fish are known; so called, from their supposed resemblance to the spurs of a fighting cock.

Though authors assure us that there are the teeth of a fish, the jaws have been found with these bodies in them; yet they do not pretend to know to what fish they belong. They are generally of an oblong conic figure, broad at the base, and narrow at the point, where they are usually a little crooked; they are halted at the root, and are from the tenth of an inch to two inches long, commonly of a chestnut colour, and are found in the strata of clay, but most usually in those of flint; and are seen more frequently in England than in any other part of the world. Hill's *Historia*, p. 64:

**Conjecture, in the Philosophy of the Mind, expresses a degree of belief founded upon slight evidence. In some cases, a disposition to conjecture, inconsiderably indulged, may be productive of many extravagancies. It may prompt us to build favourite hypotheses on very weak foundations, and to ascribe the conduct of others to wrong motives, according to our prejudices or against them. When indulged with discretion, a conjecture affords some relief to the mind from the inquietude of ignorance and uncertainty. It provides a temporary substitute for knowledge; and it frequently suggests ideas which lead to the discovery of truth.**

Conjectural criticism, and consequent emendations of ancient authors, classical and scriptural, should be exercised with great caution; otherwise, the imagination will be apt to mislead persons most eminent for their genius and learning.

It is one of the most important, and at the same time one of the most disputed points in sound criticism, says Michaelis, whether what is called "conjectura critica," may be applied to the New Testament; or, in other words, whether in certain cases, and under certain restriction, provided we use all due care and caution, we may reject the readings of all the MSS., versions, and fathers, and merely on a probable supposition, admit a reading that is supported by no written authority; and whether, if we proceed on these principles, we have any reason to expect, that we shall ever arrive at the truth. Many learned men, dejectedly felled in criticism, are of opinion, that conjectures are as allowable at present in the New Testament, as in the classic authors. Yet, however, the majority of divines formerly considered them as presumptuous, if not impious; but those persons who are so frequently attached to the printed text, are not aware, as Wetstein observes, in his *Prolegomena*, that a very great number of readings, which they so zealously support, are merely conjectures, advanced either by the ancient fathers, or by the modern editors of the Greek Testament in the 16th and 17th centuries. These readings must, therefore, be immediately rejected, if critical conjecture is wholly inadmissible. As this question is purely critical, it should be argued, not on theological, but on critical grounds. The argument which is drawn from the hypothesis, that Divine Providence would not permit the true reading in any text of the New Testament to be lost, seems to be very extraordinary, when it is urged by persons who tacitly acknowledge that the same providence has not guarded against the receptivity of conjecture in the Old Testament. Besides, no man can assert, that, because the true reading of any passage is no longer to be found, it is therefore totally lost, since the number of MSS. of the Greek Testament (together with other original documents) which have been actually collated, are trifling in comparison with the whole number that have been written; and a reading, which is now supported only by probable conjecture, may, in process of time, be confirmed by good authority. Moreover, it is by no means diminishes the certainty of our faith, that some few passages of the New Testament have certain internal marks, which discover them to be not genuine, and which render it necessary to restore the true reading by critical conjecture. Our faith would only be in danger, if the number of these passages was so very great, as to render the whole New Testament impious; or, if the principal and distinguishing doctrines of Christianity must be either added to, or taken from, the sacred text, on other authority than that of mere conjecture. But it, we beg to affirm to ourselves the power of altering articles of religion, and confining our emendations to more matters of criticism, we alter some words or sentences, the grounds of our faith are by no means affected, nor need we apprehend any evil consequences. In ancient writings, of which only one copy is extant, critical conjecture is indispensable. The necessity remains the same, even where there are several MSS. if these MSS. are only copies of one and the same more ancient MS. If we have more than a single copy of any work, and those copies are transcripts of different and distinct MSS., the necessity of critical conjecture decreases in proportion to the number of copies; but it does not entirely vanish, unless the number of the MSS. is very considerable. We have, therefore, no reason for cenfuring the critics of the 16th century, if, in their editions of the Greek Testament, they have sometimes, departed from the reading of their MSS., and subliumated such as were agreeable to probable conjecture. The probability, however, that critical conjecture alone can restore the true reading, decreases in the same proportion, as our materials of criticism, or collections of various readings increase. And since so many MSS., works of the fathers, and ancient versions made in distant countries, and in different periods, have been carefully collated; and since also those very ancient Latin versions that vary so considerably from each other, and were translated from very different Greek MSS. have been made known to the public, we might even doubt whether critical conjecture ought not at present to be entirely rejected. It has, however, its learned and zealous advocates. It deferves to be considered, in reply to the plausible objection above fuggled, that we have not a single MS. now extant, that was written in the four first centuries, and that the ancient versions have not defended us without alterations. It is likewise evident, from the writings of the fathers, that many readings were in those times in the Greek MSS., which are not now found in any, or only in a few; having been altered either by accident, or because they appeared to the transcribers to be obscure, or exceptable,
 exceptionable. It is therefore not impossible, that other readings, which have not been preferred in the works of the fathers, or in the Greek MSS., may have been equally bad; and among them, perhaps, some that were requisite. Besides, it is not impossible that there are many important MSS. of which we have no knowledge; and that a collection of those MSS. might confirm the critical conjectures of the 18th century, in the same manner as many conjectures of the 17th century have been confirmed in the 18th, by the authority of MSS., and ancient versions. It might further be added, and it deserves consideration, that all our MSS., and versions of the New Testament, were probably taken, not from the first copies of the Gospels and Epistles, which proceeded from the hands of the Apostles themselves, but from the copies of the several parts of the New Testament. If, instead of 292 MSS. enumerated by Michaelis, we had above 1000, they would still be transcripts of one and the same copy; and if this copy had any errors, which it would be the highest presumption to deny, these errors must have been transmitted into every MS. of the Greek Testament, whatever; and these errors can be remedied only by the aid of critical conjecture. Upon the whole, it appears, that a collection of critical conjectures may be of great use in establishing the genuine text of the Greek Testament; and it is likewise attended with this particular advantage, that we are led by it to examine MSS., and other original documents, with greater accuracy, in order to see whether those readings, which had no other support than conjecture, may not be established by written authority. Such a collection has been published by Bowyer, a learned bookseller in London, the third edition of which, with improvements, was published in London in 1782. Of several hundred conjectures, which Bowyer has produced, there is hardly one, says Michaelis, which, after impartial examination, will not be found probable. On the other hand, it cannot be denied, that there are some few, which bear on them the marks of probability. Several of these are examined by Michaelis, and he has added a variety of his own conjectures, for which he must refer to his work, cited at the close of this article. Besides the critical conjectures already mentioned, there is another kind of conjecture, denominated by Michaelis "theological conjecture," which consists in altering the text of the sacred writings, according to the maxims adopted by any particular party, whether it be the ruling, or the persecuted party, in the church. Although it is allowable to venture a conjecture in matters relating to history, to dates, or to names, as in these cases the Bible is not our only "principium cognoscendi," yet whatever alters the text in subjects which relate to points of divinity, evidently presupposes a "principium cognoscendi," that is prior to the Bible itself; and this is frequently nothing more than a set of principles, which this or that particular person has thought proper to adopt. It has been urged by those who defend theological conjecture, that we ought never to lose sight of the "audio is sola," or analogy of faith. Thus, if two passages in the Bible contradicted each other in matters of faith, the one must be altered. But the question recurs, how shall we determine which of the two is to be altered? "In my opinion," says Michaelis, "we should alter neither, but reject the whole, as not coming from the Deity, if it be true that there are real contradictions, for it is upon this ground, that we condemn the Koran." But every apparent contradiction is not a contradiction in reality; and passages that are seemingly at variance may, with skill and patience, be reconciled. Such is the case with respect to Rom. iii. 28. and James, ii. 24. the whole contradiction vanishing, as soon as we reflect that St. Paul understands faith in Christ, St. James faith in the unity of the Godhead. For other observations on this subject, we refer to the author, Michaelis's Introduction to the New Testament by Michaelis, vol. ii. part. 1. See Criticism.

CONIFERÆ in Botany, the fifteen natural orders in the Philodina Botanica of Link and the fifty-first of the Predictions. In the Philodina Botanica the genera included in it are abies, pinus, cupressus, thuja, juniperus, taxus, sphenia. These are all retained in the Predictions, pines and abies being united, and equifich added with a mark of doubt, and an observation that it has the pollen of flix. The order derives its name from the cones or floribres in which the seeds are contained. The fruit of juniperus, indeed, seems to be a berry, but it is properly a florible, with pulpy scales, which do not open; for it has fix-flabile conneate scales, each containing a single seed. Taxus also apparently bears a berry; but this falle berry is only the flabile receptacle almost covering the seed. All the conifer yield a resin, which renders a mould of them; evergreen. The fruit in all is biennial, produced in the spring, but not ripening and dropping its seeds until the spring after.

The coniferous cones also one of the natural orders of Jafbus, the fifth of his fifteen classes, with the following character: "Flowers monocious or dioecious. Male most frequently in a catkin, or hapsed together upon a catkin, each furnished with a scale, with or without a calyx: the flamous attached either to the calyx, or to the stem. Stamen definite or indefinite in number: filaments sometimes distinct, sometimes united into a flaque or branched stipes. Females either solitary, or capitate, or disposed in a florible or cone, densely imbricated with scales that separate the flowers: furnished either with a calyx or with a scale discharging the office of a calyx. Cone superior, conical, either double or manifold, with as many fyles and frigmas, and either as many seeds, or as many one-seeded capsules. Corema cylindrical, central, in a flixy perigynium, two-lobed; the fyles sometimes, but rarely, divided or palmat, thence appearing many-lobed. Stem a tree or shrub. It contains the following genera: 1. With a flixy perigynium: Calyx, conus, hurus, taxus. II. With only a flixy perigynium, the true conifer: Juniperus, cupressus, thuja, araucaria (Dom. beya). Lannea, pinus, abies. Venetian has the same division and genera, except that he omits araucaria.

CONIGLIANO, in Geography, a small, but populous, town, in the district of Trevinc, in the territory of Venice, which now forms part of the kingdom of Italy.

CONIL, a small town of Spain, in the kingdom of Seville, in Andaluria, on a bay to which it gives name; 15 miles S.S.E. from Cadiz, with a strong castle. Its inhabitants suffice chiefly by fishing. N. lat. 39° 16'. W. long. 6° 8'.

CONIMBRIGA, or Conimbriga, in Ancient Geography, Coimbre, a town of Spain, in Lusitania, on the Monda.

CONIN, or Konin, in Geography, a town of Poland, in the palatinate of Kalis, 15 miles S.E. of Orlic.

CONJOINED, or Conjunct, in Heraldry, a term used for charges in arms when linked together.

CONJOINT, or Conjunctor, is applied in Ancient Muffs, in the same sense as confinant, to two or more founds heard at the same time. See Consonance.

Conjoint degree, two notes which immediately follow each other in the order of the scale; as ut and re.

Conjoint tetrachords, are two tetrachords, where the same chord is the highest of the one, and the lowest of the other.

CONIQUE.
CONIQUE, Fr. This term is applied to a piece of artillery, of which the bore is wider towards the muzzle than it is towards the breech.

CONIRA, in Botany, a name used by some authors for the *murphia*. G. E. Emac. 1d. 2.

CONISALUS, in Mythology, a god of the Athenians mentioned by Strabo, and supposed to be the same with Priapus.

CONISBERG, in Geography. See KONISBERG.

CONISC, in Ancient Geography, a people of Spain, who formed a part of the Cantabri, and in their dress resembled the Gauls, according to Strabo.

CONISIUM, a town of Alm, in Myrrha, according to Pliny. Hierocles calls it *Chionias*, and makes it an episcopal city in the province of the Hellespont.

CONISOR. See GONISOR.

CONISSALIS, in Natural History, the name of a class of fossil bodies; the word is derived from *kabalos*, powder; all the species of bodies of this class being found like common sand, in form of powder, have been usually confused together, under the common name of *fundo*. The conissals are defined to be fossils of a differently debased, crystalline, or sparry matter, but always found in form of small and divided particles, great numbers of which, being amassed together, form a kind of powder.

Of this class of bodies there are two distinct and large genera. 1. The sands properly so called, which are composed of particles all appearing to have a tendency to the same regular figures, transparent, vitrifiable by a strong fire, and not soluble in, or effusing with acids. 2. The *fimmaros*, or grits, of stone found loose; these are found in form of powder, the particles of which, in general, have no tendency to any particular figure, but appear to be rudely broken fragments of larger masses. Hill's Hist. of Foss. p. 543.

CONISTERIUM, a room in the ancient Gymnasia or Palestra, in which was kept the sand for the use of the wrestlers, who were accustomed, after anointing their bodies with oil, to sprinkle themselves with sand to afford a firmer grasp in their encounters.

CONISTON, in Geography, a village in the northern part of Lancashire, in the hundred of Lonsdale. Latitude about 54° 25' lat. and longitude 2° 44' w. It is situated on the steep ascent of a mountain of blue argillaceous schists, near the northern end of a romantic lake, of fix miles in length, and one in breadth, called after its name; near this town some copper-mines are worked, but to no considerable extent, and some veins of lead-ore; slate quarries are also to be found near this place. There is a torrent or mountain stream of water which precipitates itself into the lake near this place.

CONISTORS, in Ancient Geography, a town of Spain in Celtiberia. Strabo mentions it as a very famous town.

CONITZ, or CHONITZ, in Geography, a town of Prussia, in Pomoricia; 40 miles S. of Dantizick.

CONJUGAL RIGHTS, in Law. The suit for "restitution of conjugal rights" is one species of matrimonial causes; which is brought whenever the husband or wife is guilty of "infradiction," or lives separate from the other without any sufficient reason: in which case the ecclesiastical jurisdiction will compel them to come together again, if either of them be weak enough to define it, contrary to the inclination of the other.

CONJUGATE Ant., G. in Conics. See Conic Sections.

CONJUGATE Point, in Geometry. See Point.

CONJUGATES, in Rhetoric, denote words deduced from the same origin with that of the subject: e.g. *he who does justly, is just*.

CONJUGATION, in Anatomy, a term applied by the older anatomists to the nerves coming from the brain, in the same sense that we employ the expression, pair of nerves.

Conjugation, in Grammar, an orderly distribution of the several parts or inflexions of verbs, in their different moods and tenses, to distinguish them from each other; or, the manner in which the personal terminations of verbs are changed to express the several moods and tenses.

The Latins have four conjugations distinguished by the terminations of the infinitive, *are*, *ir*, *ere*, *ire*, and most of the French grammarians reduce the conjugations of their language to the same number, ending in *er*, *ir*, and *oir*. So we have added a fifth Latin conjugation called the *mixt*, because it is composed of the third and fourth, as *architects, accius*.

The Greeks have three kinds of verbs; the first called *baryons*, because the last syllable is pronounced with a grave accent; (see *Barytonum*); such as *tau*, *tend*, and *pias*, verbs; the second are circumflex verbs, which admit a contraction in their termination, and are then marked with a circumflex accent; such as *apta*, *apta*, *amo*: the third kind comprehends the verbs in *&i*, as *mu*, *fim*. Of the first sort there are six conjugations; divided according to their characteristic, i. e. the letter preceding the termination. Accordingly verbs having the labials *u*, *o*, or *e*., form the first conjugation of barytons; those having the gutturals *k*, *g*, *x*, or *x*., the second; those having the dentals *d*, *d*, or *d*., form the third; verbs in *g*, *g*, or *g*, comprehend the fourth conjugation; the liquids *r*, *l*, or *l*, mark the fifth; while those in *a*, *a*, *a*, and *a*, distinguish the sixth conjugation. Of the second there are three, viz.: those in *a*, *e*, *o*, and those in *a*, *e*, *o*, *a*, *u*, *e*, *a*, or *o*, *u*, *o*: all the and the barytonous verbs are conjugated, that is, are varied in the same way to express mood, time, number, and person. Of the third, there are four. But Meffrs. de Port Royal reduce these 13 conjugations to two: viz., one in *a*, comprehending the barytons and circumflex verbs; and the other in *a*.

Mr. I. Jones, in his "Grammar of the Greek Tongue," on a new and improved Plan," has judiciously rejected the fore-mentioned distinctions as unnecessary, because they are useless and unmeaning: and distributed the Greek conjugations into four; viz. the active *a*, its passive *e*, the active *a*, and its passive *e*.

In the Hebrew language there are four conjugations, viz. *kal* with its passive *kipha*, *pela* with its passive *pela*, to which also may be referred *pela*, *pela* with its passive *bela*, and *bela*. The third person singular masculine of the first conjugation is the preterite of the theme; the second conjugation has a *deget* forte in the second radical; the third has the prefix letter *a*; and the fourth, the syllable *a*. In English, where the verbs have scarce any natural inflexions, but derive all their variations from additional particles, pronouns, &c. we have hardly any such thing as strict conjugations.

Some grammarians, however, distinguish English verbs into three conjugations, or classes, distinguished from one another by a peculiar formation in some principal parts belonging to each; and they observe that the three different terminations of the participles, viz. *ed*, of its contraction, *ed*, *ed*, and *ed*, may be considered as the characteristics of the conjugations.
conjugations. But as the verbs of the first conjugation would so greatly exceed in number those of the others; and as those of the third conjugation are so various in their form, and incapable of being reduced to one rule; it seems better in practice, as bishop Lowth judiciously observes, to consider the first in ed as the regular form, and the others as deviations from it: after the example of the Saxon and German grammarians. Lowth's Intro. to English Grammar, p. 124, 1772. Murray's Eng. Gram. p. 90. ed. S. Others again distinguish them by the different inflexion of the first tense in each root, and thus make four conjugations in the active voice: the first has three radicals alike: as I do read, I read; i.e. yesterday; I have read, i.e. just now. The second has the first and third radical alike: as I run, I ran, I have run. The third conjugation has the second and third radical alike: as I esteem, I esteemed, I have esteemed. The fourth has the three radicals different: as I write, I wrote, I have written or erit. The passive voice, being made up of the third radical and the auxiliary verb am, admits of no difference of conjugations. Ward's Essays on the English Language, p. 87.

Conium, in Botany, (conium); Theophrast. Diope. derived by Henry Stephens from conium, the cone of the mathematicians, a name given also, on account of its form, to that well-known children's toy, a top. From this latter sense came the verb conium, which Hefchius explains by πηχευω, implying a capacity to produce a whirling motion; and thence the poisonous herb employed by the Greeks as the means of inducing a capital punishment, was called conium, because it occasioned a fermentation of giddines in the fuller. Linnaeus unaccountably derives the word from conio, disf). Lam. Gen. 136. Schreb. 409. Willd. 52. (Cicuta. Town. 162. Hall. 766. Gart. 117. Lam. Ill. 533. Juif. 223. Vent. 3. 28. Gigl. Lam. Enc.) Cifas and order, penicandria digynia. Nat. Ord. Umbellata; Linn. Umbelliferae; Juif. Vent.

Gen. Ch. Umbel partial, and universal with many spreading rays. involucro universalis, three or many-leaved, short, unequal, membranous towards the base: partial with about three leaves, only half enclosing the pedicels. Cal. feebly perceptible. Cor. Petals five, flexed, heart-shaped, unequal. Stam. Filaments five, about the length of the petals; anthers roundish. Fil. Germ inferior; styles two, short, reflexed; stigma obsolete. Peric. none. Fruit nearly globular, with five crenate ridges; composed of two seeds, which are convex, almost hemispherical, fringed on one side, flat on the other, separating as they become ripe.

Eff. Ch. Partial involucre only on one side, about three-leaved. Fruit nearly globular, with five crenate ridges.


"Seeds striated." Linn. "Stem spotted at the base; furrows of the seeds crenate." Lam. "Seeds without prickles; stem much branched, shining, striated." Dr. Smith. Root biennial, spindle-shaped, often branched, white, fleshy. Stem three or four feet high, ereft, cylindrical, hollow, folowed, smooth, shining, marked with purple spots, much branched, especially towards the top, leafy. Leaves supra decumant, or several times pinnated; bottom ones very large, sometimes two feet long; leaflets oblong, acutely notched, dark green above, pale underneath. Rays of the umbel from ten to twelve; of the umbellule fifteen or sixteen. General involucre commonly many-leaved, deftexed. Petals white, heart-shaped, infefted, nearly equal. The whole plant is narcotic, with a disagreeable smell and nauseous taste. Very different opinions have been entertained with respect to its active qualities, but it may be doubted whether authors have always intended the same plant. Haler was inclined to think, that the plant which was fatal to Socrates and Phocion, was not that now before us, but the cicuta virosa of Linnaeus, which the French writers have called cicutaria. La Marse, on the other hand, believeth that the conium maculatum of Linnaeus, his cicuta magna, is the cicuta of ancient authors, the very plant by which Socrates was poisoned; and forcefully enunciates Linnaeus for changing its name to conium. But if this great botanist had looked into the Greek authors, he would have found that Linnaeus only restored the most ancient name, and that the word cicuta is entirely of Latin origin, unknown to the Greek language. Whether Linnaeus would not have done better, if he had retained the term cicuta, which had been adopted by all the modern botanists before him, is a question to which an affirmative answer may perhaps be given. His cicuta virosa might then, in concurrence with Haler's opinion, have been called conium. But when the change was made and had, through the extensive circulation of the works of Linnaeus, obtained general currency, a revival of the ancient name, instead of removing, has, in fact, increased the confusion. Whatever may have been the plant by which Socrates was judicially murdered, our conium maculatum unquestionably possesses deleterious qualities; but, as Dr. Smith observes, it is happily too nauseous to be incunabally swallowed in any dangerous quantity. See Cicuta in the Materia Medica, where it should have been observed that Plato does not call the plant, by which Socrates perished, cicuta, a word which he had never heard; nor does he give it any Greek name peculiar to it; but constantly uses the very general term Κοινον, which denotes a strong poison either poisonous or medicinal. 2. C. rugosum. Willd. 2. Thum. prod. 50. (C. fullirificum; Berg. cap. 77.) "Seeds wrinkled." Stem somewhat flabby. A native of the Cape of Good Hope. 3. C. rigens. Linn. Mant. 56. Lam. 2. Lam. 2. Willd. 2. Thum. prod. 50. "Seeds somewhat muricate; peduncles furrowed; leaflets channelled, obtuse." Root perennial. Stem purplish, rigid, striated, creft, diffuse, branched. Leaves twice-winged, somewhat feftthy, dented, obtus, crenulate, hard, the colour of ruf; petioles longitudinally channelled. Florus all fertile, white; leaflets of the general involucre five, shorter than the rays of the umbel; one or two divided; those of the little umbels few; a few of them crenate, petiole equal, lanceolate, rolled inwards. Seeds reddish, striated and somewhat muricate. A native of the Cape of Good Hope, on the coast, introduced into England in 1787, by Mr. Aiton. 4. C. africana. Linn. Sp. Ph. 2. Mart. 2. Willd. 4. Juc. Hort. tab. 102. (Cicuta africana; Linn. 3. Ill. tab. 105. fig. 2. Canavilla africana; Boerh. Lugd. h. 1. tab. 62. Capnophyllum; Gart. tab. 85. fig. 6.) "Seeds prickly." Linn. "Seeds muricate; pedioles and peduncles even-surfaced." Willd. "Leaves twice winged, glaucous; petioles and peduncles even-surfaced; seeds tooth-muricate." Lam. Root annual. Sp. three or four inches long, herbaceous, cylindrical, smooth, glaucous; with a few leaves, and one or two short axillary branches. Root-leaves almost as long as the stem; leaflets flat, not channelled, small, gashed. Flowers white, almost regular, in small terminal umbels; leaflets of the general involucre from three to five, membranous towards the base.
Eclipses of the sun never happen, but when there is a conjunction of the sun and moon in or near the nodes of the eclipse.

Conjunction, in Grammar, a particle which expresses a relation or dependence between words and phrases; thus called, because it serves to join or connect the parts or members of a discourse, which is its common use, and also to connect words; so as to shew the relations which those words so united have to other parts of the sentence.

Conjunctions, however, often unite sentences, when they appear to unite only words: e.g. "Durli and interred for bid vicious indulgences," which form of expression contains in reality two sentences. See Murray's Eng. Gram. p. 105, ed. 8.

Mr. Harris defines a conjunction to be a part of speech, void of signification itself, but so formed as to help signification, by making two or more significant sentences to be one significant sentence; and he distributes them into such as connect sentences and their meaning, and such as connect the sentences whist they do join the fence. The former are conjunctive, and are either copulative or connective, the former joining all sentences, however incongruous in signification, and the latter joining only those which have a natural connection; and the latter disjunctive some of which are simple, as either it is day or it is night, and adversative-as, it is not day but it is night. Harris, p. 240, &c. See Adversative a d Consecutive.

Mr. Horne Tooke, in his "Diversions of Purley," has made some remarks, in his usual manner, on the definition of a conjunction given by Mr. Harris, charging the author not only with self-contradiction, but with great want of peculiarity. Accordingly he thus rates Mr. Harris's definition: "A sound significant devoid of signification, (referring to Mr. Harris's definition of a word,) having at the same time a kind of obscure signification; and yet having neither signification nor no signification; but a middle something between signification and no signification, shewing the attributes both of signification and no signification; and linking signification and no signification together." This acute and ingenious writer denies conjunctions to be a separate fort of words or parts of speech by themselves. For they have not a separate manner of signification; although they are not devoid of signification. And the particular signification of each must be fought for from amongst the other parts of speech, by the help of the particular etymology of each respective language. By such means alone can we clear away the obscurity and errors in which grammarians and philosophers have been involved by the corruption of some common words, and the utilful abbreviations of construction. (See Abbreviation.) And, at the same time, we shall get rid of that farrago of uleels dilutions into conjunctive, adjective, disjunctive, fubdisjunctive, copulative, negative copulative, connective, &c. &c. &c., which explain nothing; and (as most other technical terms are abounded) serve only to throw a veil over the ignorance of those who employ them. In disfounding conjunctions from the rank which they have long held as distinct parts of speech, Mr. Tooke cites several authorities; and among others, bishop Wilkins, who, in his "Effay towards a real Character and a philosophical Language," (part iii. c. 4. p. 312), says, "According to the true philosophy of speech, I cannot conceive this kind of words" (speaking of adverbs and conjunctions) "to be properly a distinct part of speech, as they are commonly called. But until they can be distributed into their proper places, I have so far compiled with the grammars of milti- lated languages as to place them here together." Mr. Locke, who was much indebted to Wilkins, expresses his dissatisfaction...
difficult to deal with all the accounts of language which he had seen. Some judgments were made particularly from the number of these mysterious conjunctions, though he left it amongst them: and Servius, Scioppius, C. J. Veslius, Perizionius, and others, have explained and displaced many other suppositious adverbs and conjunctions. "In short," says the author whom we are now citing, "there is not such a thing as a conjunction in any language, which may not, by a skilful herald, be traced home to its own family and origin; without having recourse to contradiction and mythology with Mr. Harris; or, with Mr. Locke, eluding the head of man, to give it such a birth as Minerva's from the brain of Jupiter."

The author's scheme is fully developed in the following table, and the several conjunctions which it exhibits: and he says that

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<tr>
<th>If the past participle</th>
<th>and the participle of Seon, To See.</th>
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<td>An</td>
<td>or</td>
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<td>Son</td>
<td>or</td>
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<td>Sin</td>
<td>or</td>
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<td>Sis</td>
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For a farther and ample illustration and proof of the etymologies above given, and several others, we must refer to Tooke's Elia Philothea, or Diversions of Purley, part i. p. 125—287, ed. 2.

The conjunction, according to the long-established classification, is the sixth of the eight vulgar parts of speech. See Speech.

Conjunctions render the discourse more smooth and fluent; and serve very good purposes in the argumentative and narrative style; but they must ever be omitted where a person speaks with emotion, as only serving to weaken and enervate it. Boileau observes, that nothing gives more warmth and life to a discourse than to drop the conjunctions or copulative; a passion, adds he, embarrased with conjunctions and useless particles, loses all the fire and vehemence it would require in its progress.

Conjunctions are of various kinds.

Conjunctions copulative, or conjunctive, are those which express a relation of union or comparison between things; and serve to connect or continue a sentence, as, and, only, as much as, in the same manner as, neither more nor less, insomuch as, not only, but also.

Conjunctions adversative, those which express a restriction, or contrariety; as, but, nevertheless, although, for from. See Adversative.

Conjunctions causal, those which show that the reason of something is alleged: as, for, because, seeing, the rather since, insomuch as.

Conjunctions cunctive, those which denote a consequence drawn: as, for which reason, but then, of consequence, so that, &c.

Conjunctions conditional, are those which import a condition: as, if, if not, on condition that, provided that, in case of. See Conditional.

Conjunctions continuative, those which express a succession, or continuation of the discourse: as, in effect, even, whatever it be. See Consecutive.

Conjunctions disjunctive, those which express a relation of separation or division, or which serve not only to connect and continue the sentence, but also to express opposition of meaning in different degrees: as, neither, whether, or, though, yet, but, &c.

Conjunctions dubitative, those which express some doubt, or tisension of opinion: as, if, that is to say, &c.

Conjunctions exceptive, are, if it be not, unless that, &c.

Conjunctiva Tunicus, in Anatomy, is the membrane which connects the front of the eyelid to the posterior surface of the eyeball. See Eye.

Conjurati Fratres. See Fratres.

Conjuration, in Antiquity, denotes an oath; and conjuratus the name with conjurator, viz. one who is bound by the same oath. Conjurare is used when several persons affirm a thing by oath. Mon. Ang. 7. p. 207.

Conjuration, in Law, signifies the plot or conspiracy, made by persons combining together by oath or promise, to do some public harm. But it was more particularly used, formerly, for having a personal conference with the devil, or some evil spirit, to know any secret, or to effect any purpose. Anno 5 Eliz. c. 16.

It is laid in some of our law books, that the difference between conjuration and witchcraft is, that the former endea- (continued)
there are but medicines and ceremonial forms of words (commonly called charm) without appurition. Covel.

Hawkins, in his "Pleas of the Crown," (l. i. c. 3) says, that conjurers are those, who, by force of certain magic words, endeavour to raise the devil, and obliges him to execute their commands. Witches are such who, by way of conference, bargain with an evil spirit, to do what they desire of him; and forcers are those who, by the use of certain superstitious words, or by the means of images, &c. are said to produce strange effects, above the ordinary course of nature. All these were anciently punished in the same manner as bewitch, by the writ "de Jure et cum beneficio," after a sentence in the ecclesiastical court; and they might be condemned to the pillory, &c. as an indictment at common law, 2 Inst. 44. H. P. C. 32. The president Montesquieu also (Sp. Laws, b. xii. c. 5) marks forcery and hereby together; laying it down, at the same time, as an important maxim, that we ought to be very circumspect in the prosecution of magic and hereby; because the most unexceptionable conduct, the purest morals, and the constant practice of every duty in life, are not a sufficient security against the suspicion of crimes like these. See Witch-craft.

Our fore-fathers were stronger believers in the ridiculous stories that have been generally told concerning witchcraft and forcery than any who live in these more enlightened times, when they enacted by stat. 33 Hen. VIII. c. 8. all witchcraft and forcery to be felony without benefit of clergy; and again by stat. 1 Jac. 1. c. 12. that all persons invoking any evil spirit, or confounding, coveting and with, entertaining, employing, feeding, or rewarding any evil spirit; or taking up dead bodies from their graves to be used in any witchcraft, forcery, charm, or incantation; or killing or otherwise hurting any person by such infernal acts; should be guilty of felony without benefit of clergy, and suffer death. And if any person should attempt by forcery to discover hidden treasure, or to restore stolen goods, or to provoke unlawful love, or to hurt any man or beast, though the fame were not effected, he or she should suffer imprisonment and pillory for the first offence, and death for the second. These acts continued in force till lately, to the terror of all ancient females in the kingdom; and many poor wretches were thus sacrificed to the prejudice of their neighbours, and their own illusions: not a few having, by fame means or other, confessed the fact at the galleries. But though some of the tales that led to these penal statutes still exist among the uninformed vulgar, as the triumph of impotence over credulity, and as bugbear to children, inexcusably employed for this purpose; all executions for this dubious crime are now at an end:—our legislature having at length followed the wise example of Louis XIV. in France, who thought proper by an edict to retrain the tribunals of justice from receiving informations of witchcraft. (See Voltaire's Age of Lewis XIV. c. 29. Mor. Un. H. R. vol. xxv. p. 245.) Yet Voughan's (De Droit Criminal, 351-450.) still reckon up forcery and witchcraft among the crimes punishable in France. With us the above recited statutes against conjuration and witchcraft are repealed; and no prosecution shall be carried on for the future against any person for conjuration, witchcraft, forcery, or incantation: but where persons pretend to exercise any kind of witchcraft or conjuration, &c. or undertake to tell fortunes, or from their skill in any occult science, to discover where goods stolen or lost may be found, they shall be taken upon conviction be imprisoned a year, and stand in the pillory once in every quarter, in some market-town, and may be ordered to give security for their good behaviour, by stat. 9 G. I. II. c. 5.

CONKAIL, in Geography, a town of Hindostan, in the province of Berar, situated between a high rocky hill and the south bank of the Mahanondice river, which riffs at a place called Sowahow, about 7 miles S. of Corkair. The rajah of Corkair has built a fortress on the summit of the hill, and mounted it with two guns.

CONKERE, a port of Shickan Tartary. N. lat. 44° 54'.

CONLIE, a small town of France, in the department of Jura, and chief place of a canton in the district of Long le Saulnier, with 1201 inhabitants. The canton itself reckons 20 communes and 9935 inhabitants upon a territorial extent of 220 kilometres.

CONLIE, a small town of France, in the department of Jura, and chief place of a canton in the district of Long le Saulnier, with 1201 inhabitants. The canton itself reckons 20 communes and 9935 inhabitants upon an extent of 1421 kilometres.

CONLOBONGI, a town of the island of Borneo; 120 miles N. of Banjier-Maffing.

CONN, in Sea Language. See Cond.

CONN, Lough, in Geography, a lake of the county of Mayo, Ireland, which is at the foot of mount Neptune, and extends 9 miles in length, but not more than two in breadth. There is a great number of islands in this lake, some of which are well planted, and being very fertile in fine grass, serve for pastures to sheep and other cattle. That kind of trout called Gilleara, is also found here in abundance. Dr. Shaw observes of these, that they do not appear to be specifically different from the common trout, but by living much on shell-fish, and swallowing small bones at the same time, their homasacquire a much greater degree of thickness, and a kind of muscular appearance, so as to resemble a sort of gizzard. Lough Conn stretches from N. to S. between the Kilbella and Coblefar.

CONNA, in Botany, Rheed. See Cassia Fisfalla.

CONNA, in Ancient Geography, a town of Asia Minor, in the Greater Phrygia. Prolemy. The 6th council of Constantinople places it in Pamphylia.

CONNAC, denotes in Arabia, Palefinne, Barbary, &c. the place, whether covered or not, where travellers or caravans halt or break off their journey for a time, in order to rest and refresh themselves and their beasts of burden. Similar to this was the "malon," or inn (Gen. xii. 27. xliii. 21. &c.) where the sons of Jacob opened their facks to give their fives provender. The appellation Connac in the East corresponds with the παραχων and καταχωμιa in the Old or New Testament, which are rendered inns or hospita. But excepting the caravansaries which may in some measure answer to the παραχων and καταχωμια, there are, properly speaking, no houses of entertainment in Barbary; at least, in the sense usually applied to inns or hospita, i.e. where travellers can be provided with lodgings, provisions, and other necessaries for the night.

CONNAMARA, the name of a district, in the county of Galway, Ireland, noted for the woolen stockings knitted there, and for the wild state of the country. It is in the barony of Bullinahich, and an account of it will be found under that name. See Ballinahich.

Gen. Ch. Cal. one-leaved, with five segments; or five-leaved. Cor. petals five, lanceolate, erect, equal. Stam. filaments ten, awl-shaped, connected at the base, (in pairs, Lam.), alternately larger and smaller; anthers roundish. Pf. germ fingle (except in one species), oblong, villous; style cylindrical; stigma obtuse. Peric. capsule gibbous, one-celled, either two-valved or dithecious on one side. Seel. fingle, large.


Species, I. C. aficanus. Ceylon Sumach. Wildl. 2. (C. monoecarpus). Linn. Mart. 1. Rhus zealyanicus trifoliatus pha- seolus racemus, floribus cyprium (sic); Burm. Zeyl. 196. tab. 89. Phaeseolus arborezens zealyanicus monoecarpus; Rai. Symb. 438. "Leaves ternate; leaves roundish, egg-shaped, one-nerved, veined." A tree. Leaves alternate, petioled; leaves acuminate, quite entire, smooth, equal, petiolated. Raceme erect, terminal. A native of the East Indies. 2. C. pentaphylus. Lam. 1. Wildl. 3. (Cavan. Diff. 7. 376. tab. 225.) "Leaves ternate; leaves roundish, egg-shaped, three-nerved; flowers pentagamous." A tree. Branches cylindrical, smooth, leafy. Leaves alternate, acute, entire, smooth, somewhat coriaceous, finely veined underneath. Flowers small, numerous, in axillary and terminal spikes, forming a kind of paniculate, sessile villous on the outside. Illicium, three to five, villous, short, appearing united at the base; styles shorter than the stamens; stigmas flat or truncate. Described by La Marec from dried epimecia without fruit, communicated by Sonnerat. A native of Madagascar and Guinea. 3. C. africana. Mart. 2. Lam. 3. Wildl. 1. Vahl. Symb. 3. 86. Cavan. Diff. 7. 375. tab. 221. (Omphalobium indicum; Gart. vol. i. 253. tab. 46. fig. 2, and vol. ii. praef. p. 33.) "Leaves ternate; leaves oblong, veined, acuminate." Wildl. "Leaves ternate, leaves egg-shaped, acute at both ends, veined underneath; flowers paniculate, stamens monogyne." Lam. A shrub. Branches cylindrical, smooth. Leaves alternate, petiolated; leaves four or five inches long, smooth, even-surfaced above, veined and veined underneath. Flowers small, numerous; panicle compound, oblong, terminal. Capsule oblong, almost cylindrical, gibbous on one side, pointed at both ends, pedicelled, two-valved. Lam. Capsule valves, dentate on the gibbous or outer side. Seed large, somewhat kidney-shaped, smooth, shining, dark brown-coloured, with an oblong pit on each side; aril incommnen. Filaments, slender, variously lobed, so as to appear curled, its on one side, and the exterior part of the seed. Gart. 4. C. pinnatus. Lam. 2. I1liff. tab. 572. Wildl. 5. Cavan. Diff. 7. 375. tab. 222. (Pericymeigil; Rheed. Mal. 6. 43. tab. 44.) "Leaves ternate and pinnate; leaves oblong, veined; petals with two bristles at the base." Wildl. A tree. Root perennial. Leaves of the fame configuration, and finely veined with those of C. pentagynus. Flowers white, in terminal and axillary panicles; calyx villous on the outside; petals lanceolate, with two remarkable bristles a little above the base, one on each side, pointing downwards, acute and somewhat divaricate; germ fingle, villous. Capsules oblong, gibbous on one side, suddenly narrowed at the base, ending rather abruptly in a point, one-celled. Seed one. A native of the East Indies; described from specimens communicated to La Marec by Sonnerat. 5. C. Santaloides. Mart. 3. Wildl. 4. Vahl. Symb. 3. 87. (Santaloides; Flor. Zey. 428.) "Leaves pinnate; leaves egg-shaped, acuminate; pedicels alternately, aggregate; flowers in racemes. A tree. Branches branch off from the top. Leaves unequally pinnate, scattered, remote, petiolate; leaves sometimes an inch and half long, quite entire, perfectly smooth; shining above; re-


ticularly veined underneath, on very short channelled per-
tioles. Peduncles from four to six together, half the length of the leaf, smooth; partially once, scattered with three or four pedicelled flowers towards the top. A native of the East Indies. 6. C. miniflora. Mart. 4. Wildl. 7. Vahl. Symb. 387. "Leaves pinnate; leaves about twenty-one, oval-oblong, emarginate; racemes axillary." A tree. Branches cylindrical, villous towards the top. Leaves growing near the ends of the branches, alternate, approximating, on slightly villous petioles; leaves opposite or alter-
tate, on very short petioles, inner ones smaller, obtuse, smooth, finely veined on the upper surface, paler underneath. Peduncles axillary, usually three together, the length of the leaves, slightly hoary; pedicels scattered, filiform, the lowest commonly two-flowered. Flowers small, with a minute bracte at the base of each pedicel. A native of the islands of Nicobar.

Connaurus decumbens; Wildl. Vahl. See Hermannia triphylla.

Propagation and Culture. C. aficanus is usually propagated in this country by laying down the young branches, which, if tongue in the manner practiced for carnations, and duly watered, will put out roots in twelve months. They may then be cut off from the old plants, and planted in separate small pots which should be filled with light fresh earth and plunged into a moderate hot-bed. They should afterwards be placed in a dry loft; but for about three months in summer they will bear the open air in a sheltered situation. The cuttings of this plant will sometimes take root, but without great care seldom succeed.

Connata folia. See leaf.

Connaught, in Geography, the name of the western province of Ireland, which contains the counties of Galway, Mayo, Sligo, Leitrim, and Roscommon. At the time of Strong-

bow’s invasion, it was a distinct kingdom, and its king was monarch of Ireland. This dignity continued until the reign of Henry III. after which time, the province was divided amongst petty chiefains, some of whom were of English extraction, until the reign of queen Elizabeth, when the earl of Suffolk, lord deputy, divided it into counties, A. D. 1503.; and Sir H. Sidney, lord deputy, established a lord president of Connaught, A. D. 1517. In 1604, Sir Arthur Chichele, lord deputy, established a circuit for judges of assize in Connaught. At present, the distinction of pro-

vinces is not attended to in any public acts; and indeed, as calculated to keep up a provincial spirit, which has often led to bitter animosities, it ought to be as much as possible disconsolenced.

Connaught Warm. See Warm.

Connaux, in Geography, a town of France, in the department of the Gard, and district of Uzes; three leagues N.E. of Uzes.

Conn, Cone, or Cow, in Geography, the county of Down, Ireland. See Strangford.

Connaught, and also Ashlada, are small rivers of America, in the state of Ohio, which form good harbours for boats and small craft on the borders of Lake Erie.

Connecticut, one of the United States of America, called by the ancient nations Squamicut, lying between 41° and 43° 2' N. lat., and between 71° 20' and 73° 15' W. long.; extending in its greatest length 100 miles, and great-

eth breadth 72 miles; and comprehending about 4074 miles, or about 2,640,000 acres. It is bounded on the north by Massachusetts; on the south by Rhode Island; and on the south by the Sound, which separates it from Long Island; and on the west by the state of New York. Connecticut is divided into eight counties, viz. Fairfield, the chief towns of which are
are Fairfield and Danbury; New Haven, with a capital of the
same name; Middlesex, the chief towns of which are
Middleton and Haddam; and New London, the chief towns
of which are New London and Norwich; which four coun-
ties extend along the Sound from W. to E.: Litchfield,
Hartford, Tolland, and Windham, each having a capital of
the same name respectively, which four counties extend
in the same direction with the border of the State of
Massachusetts. The first counties contain about 100 towns-
ships, which are subdivided into parishes, each of which has
one or more places of public worship, school-houses at con-
venient distances, and a college at New Haven. See Col-
lege. Each township is a corporation, invested with suffi-
cient powers for its own regulation. The number of repre-
sentatives is sometimes 180; but more commonly about 160.
The principal rivers in this State are Connecticut, Housat-
nick, and the Thames, with their branches; which see
respectively. The whole sea-coast is inhabited with harbours,
which are safe and commodious; but the principal are those
of New Haven and New London. This State lends seven
representatives to Congress. The inhabitants are almost
wholly of English descent, besides whom they have no
Dutch, French, or Germans, and few Scots or Irish. The
original stock, from which have sprung all the present occu-
piers of Connecticut, and the numerous emigrants from
hence to every part of the United States, consist of 3000
persons, who settled in the towns of Hartford, New Haven,
Windorf, Guilford, Milford, and Weathersfield, about the
year 1635 and 1636. In 1756 the population amounted to
120,611 persons; in 1774 to 197,856; in 1782 to
202,877 whites, and 6273 Indians and negroes; in 1790 to
237,946, of whom 27,662 were slaves; and by the census in
1800, to 251,002, of whom 121,113 were free white males,
123,528 free white females, 5300 free persons, except In-
dians, not taxed, and 951 slaves.

Connecticut, notwithstanding the changes of temperature
to which it is subjected, is very healthful. The surface of
the country exhibits mountains, hills, and valleys; and though
it is very well watered, some small parts of it are barren.
Its chief productions are Indian corn, rye, wheat, oats,
barley, and buck-wheat; flesh in abundance, some hemp,
potatoes of several kinds, pumpkins, turnips, peas, beans,
&c., together with fruits of all kinds which are com-
mon to the climate. The soil is well adapted for pasture
and moving, so that the farmers are enabled to feed a great
number of neat cattle and horses. This State carries on its
chief trade with the West Indies, in vessels from 60 to
140 tons. Its exports consist of horses, miles, oxen, oak-
leaves, hoops, pine-boards, oak-panks, beans, Indian corn,
fish, beef, pork, &c.; and a large number of coalings ves-
fels is employed in carrying the produce of Connecticut to
the other States; from which they receive in return, rice,
d pronounce, and money. But as New York is nearer, much
of its produce, particularly that of the western parts, is carried
thither; such as pot and pearl-ashes, flax-seed, beef, pork,
cheese, and butter, in large quantities. The value of the
whole exported produce and commodities from this State,
before the year 1774, was then estimated at about 200,000,
lawful money, annually. In the year ending September
30, 1791, the amount of foreign exports was 710,340 dol-
ars, besides articles carried to different parts of the United
States to a great amount; in 1792 it was 740,925 dollars;
in 1793, 770,239 dollars; in 1794, 806,746 dollars; and in
1804, 1,516,110 dollars, comprehending 1,486,882 domes-
tic and 29,228 foreign. This State owns and employs in
the foreign and coating trade more than 33,597 tons of
shipping. The farmers in Connecticut are generally clothed
in plain, decent, homespun cloth; and both their linens and
woollens are domestic manufactures, strong though coarse;
and many of their cloths are fine and handsome. This State
has large orchards of mulberry trees, and silk-worms have
been reared with such success, that they promise a supply of
silk, not only to the inhabitants, but also for exportation.
New Haven has linen and button manufactories; they have
established a woolen manufactory at Hartford, besides glis
tones, a flax and powder mill, iron works, and a filleting
mill. Iron works are also established at Salisbury and Nor-
wich, and in other parts of the State. Stafford has a furn-
ace, at which are made large quantities of hollow ware,
and other ironmongery, sufficient for the supply of the
whole State. Paper is manufactured at Norwich, Hartford,
New Haven, and in Litchfield county. Ironmongery, hats,
candles, leather, shoes and boots are manufactured in this
State.

Connecticut is laid out in small farms, from 50 to 300
and 400 acres each, which are held by the farmers in fee-
simple, and are generally well cultivated. The State is
chequered with innumerable roads or highways, crossing
each other in every direction; nor can a traveller pass more
than two or three miles, even in the most unfrequented parts,
without finding a house, or cottage, and a farm in such a
condition of improvement as to afford necessities for the sup-
port of a family. The whole State, it is said, refines a well-cultivated garden, which by industry produces the ne-
cessaries and conveniences of life in great plenty, without its
luxuries. To the agricultural mode of life prevailing in this
State with which a comfortable subsistence may be obtained,
so encouraging to early marriage, and also to the religious
liberty that is maintained, we may ascribe the rapid ad-
vance of this State in population. Luxury has not yet found
its way into this State, nor contaminated the manners of
the people. The common mode of travelling, both for men
and women, is on horseback; in this State there are few
coaches, but many chaises and whiskeys. In the winter is
used the sleigh, which is a vehicle drawn by two horses, and
carrying six persons in its box, which hangs on four poles
standing on two feet riders, or large skates. Dancing,
shifting, hunting, skating, and riding in sleighs on the ice,
are the chief amusements in this State. The men, in gen-
eral, throughout this province, are tall, stout, and robust;
the women are fair, handsome, and genteel; strictly virtuous,
and well-informed. We may observe, in general, that there
is no part of the world in which the education of all ranks
of people is more an object of attention than in this State.
Almost every town is divided into districts, each of which
has a public school kept in a manner a great part of the
year. Somewhat more than one-third of the money arising
from a tax on the polls and rateable estate of the inhab-
its, is appropriated to the support of schools in the several
towns, for the education of children and youth. The law
enjoins that a grammar-school shall be kept in every county-
town throughout the State. A certain gravity and serious-
ness of deportment, accompanied with a degree of stately
and reserve, appear in the full intercourse of the inhabitants
with strangers; but after a short acquaintance, they become
very familiar and inquisitive. Their hospitality is exemplary
and laudable. In their character there is a certain trait,
which renders them lefts amiable; and that is their fondness
for settling their trivial disputes "according to law;" and the
prevailence of this litigious spirit affords employment for
a numerous body of lawyers. This party spirit is,
however, subduing; their public proceedings are conducted
with calmness and candour; and as they are well informed
with
with regard to their rights, and judicious in the methods they adopt for securing them, the state enjoys a great share of political tranquility. Another circumstance, favourable to internal peace and harmony, is the abatement of that rage for theological disputations which formerly prevailed. The religion, or at least the church government and discipline, of this state, is such as favors to be peculiarly adapted to a republican government. Each church has a separate jurisdiction, and claims authority to chuse its own minister, to exercise judgment, and to enjoy religious institutions, within itself. The churches, however, amounting, feys Morse, to about 250, of the congregational denomination, in which are about 25,000 communicants and 175 pastors, are not strictly independent of each other; they associate for mutual convenience and benefit. The associations have power to license candidates for the ministry, to consult for the general welfare, and to recommend the adoption of measures by the churches, but have no authority to enforce them. Of these associations there are eleven in the state, and they meet twice in a year. All these are combined in one general association formed in 1709, consisting of delegates from the several associations which meet annually. All forms of religion that are consistent with the peace of society are tolerated in Connecticut; and a spirit of liberality and catholicism is said to be increasing. In this state there are few religious sects; the majority of the people consist of congrutationalists. But of these, there are episcopalians and baptists; the episcopal church is recent and by the superintendence of a bishop.

The constitution of Connecticut is founded on its charter, which was granted by Charles II. in 1662, and on a law of the state. Agreeably to this charter, the supreme legislative authority of the state is vested in a governor, deputy-governor, 12 councilors or councillors, and the representatives of the people, styled the General Assembly. The governor, expected-governor, and councilors, are annually chosen by the freemen in the month of May. The representatives (whole number not to exceed two from each town) are chosen by the freemen twice in a year, to attend the two annual sessions, on the second Tuesday of May and October. The general assembly is divided into two branches, called the upper and lower houses: the former is composed of the governor, deputy-governor, and councilors; and the latter consists of the representatives of the people. No law can pass without the concurrence of both houses. They have several law courts, of which the superior consists of five judges. The general assembly only have power to grant pardons and reprieves; to declare commissions of bankruptcies; or to protect the persons and estates of unfortunate debtors. The feudal system of sequestrations was never adopted in this state: the whole real estate of intestates is divided equally among the children, males and females; and all estates given in tail must be given to some person then in being, or to their immediate issue, and shall become fee-simple estates to the issue of the first donee in tail. The widow of an intestate is entitled to a third part of the personal estate for ever, and to her dower, or third part of the houses and lands belonging to the intestate at the time of his death, during her life. Attorneys are admitted and qualified by the county courts. Before their admission to the bar, they must study two years with a practising attorney in the state, if they have had a college education, and three years if they have not: their morals must be unblemished, and they must be examined by the attorneys of the court of the county where they are admitted, and be by them recommended to the court. There are, upon an average, about 13 attorneys to each county, and 150 in the whole state.

The American revolution, which so essentially affected the government of most of the colonies, produced no very perceptible alteration in the government of Connecticut. While under the jurisdiction of Great Britain, they elected their own governors, and all subordinate civil officers, and made their own laws, in the same manner, and with as little control, as they now do.

The present territory of Connecticut, at the time of the first arrival of the English, was peopled by the Pequots, the Mohegans, Podunk, and many other smaller tribes of Indians. The Pequots were numerous and warlike; and their country extended along the south coast from Pauktuck to Connecticut river; and about the year 1632, this powerful tribe extended its conquests over a considerable part of Connecticut, Long Island, and a part of Narragansett, the ancient Indian name of New London; the seat of the sovereignty of the whole nation was Pequot. The Mohegans were numerous, and their territory extensive; it comprehended most of New London county, almost the whole county of Windham, and a part of the counties of Tolland and Hartford. The Podunk inhabited East Hartford, and the adjacent country. In 1774 there remained of the descendants of the ancient nations on the 1603 persons; most of whom lived at Mohegon, between Norwich and New London. From the rapid decrease of the Indians, it is concluded that their number in this state does not now exceed 400.

The first government of Connecticut was made by the Plymouth council to the Earl of Warwick in 1632; and, in the following year, he assigned this grant to lord Say or Seal, lord Brook, and others. In 1652, an attempt was made on the English settlements by a number of Indian traders, who settled at Windsor. In the same year, a little before the arrival of the English, some Dutch traders settled at Hartford, the remains of whose settlements are still visible on the banks of Connecticut river. In 1634, lord Say and Seal, &c. sent over a small number of persons, who built a fort at Sibbybrook, and made a treaty with the Pequot Indians for the lands on Connecticut river. A number of adventurers afterwards settled in this province; and in 1634, they purchased of the agent of lord Say and Seal, and lord Brook, their right in the colony of Connecticut for 1600/. Connecticut and New Haven continued two distinct governments for many years; they extended their territories and rapidly increased. At length, John Winthrop, esq., who had been chosen governor of Connecticut, was employed to solicit a charter, which was obtained from Charles II. in 1662. Some jealousy was excited for a little while between this colony and that of New Haven; but 1665, these two colonies formed an union, which has ever since amicably subsisted; and the charter of king Charles continues to be the basis of their government. At the close of the revolution, Connecticut ceded all her charter claims west of Pennsylvania to Congress, referring only a tract of land as wide as the state of Connecticut, and 120 miles in length; bounded east on the western line of Pennsylvania, and north by lake Erie, containing nearly four millions of acres. The cession was accepted by Congress, which cedes to Connecticut her title to these lands. Morse's Geog.

Connecticut, the most considerable river in the eastern part of the United States, which rises in the highlands which separate the states of Vermont and New Hampshire from Lower Canada. This river has been surveyed about 25 miles beyond the 45th degree of latitude to the head spring of its northern branch; from which to its mouth it is upwards of 300 miles, pursuing its course through a settled country, and having on its banks a great number of the most flourishing and pleasant towns in the United States.
It is from 80 to 100 rods wide, at the distance of 130 miles from its mouth. Its course between Vermont and New Hampshire is generally S.S.W., and also through Massachusetts, and part of Connecticut, until it reaches the city of Middleton; after which it runs in a S.S.E. direction to its mouth, fertilizing the lands through which it flows, though its navigation is much obstructed by a great variety of falls. At its mouth also is a bar of sand, which very much impedes its navigation; however this river is navigable to Hartford city, upwards of 50 miles from its mouth; and the produce of the country for 200 miles above it, is brought thither in boats, which are flat bottomed, long and narrow, and so light as to be portable in cars. Before the construction of locks and canals on this river, they were taken out at three different carrying places, all of which made 15 miles; but these obstructions will, probably, be soon wholly removed. Sturgeon, salmon, and shad, are caught in plenty in their feaon, from the mouth of the river upwards, excepting angler, which do not ascend the upper falls; besides a variety of small fish, such as pike, carp, perch, &c.

Connecticut is also the name of a stream in Long Island, in the state of New York, which falls into a bay at the S. side of the island.

Connecting Oil. See Oil.

Connection, cr Connexion, a relation whereby one thing adheres to, or depends on another.

Eucild's propositions have such a connection among themselves, that the latter cannot subsist without the former.

Connection, or continuity, in the Drama, consists in the joining of the several scenes together.

When the scenes of an act succeed one another immediately, and are so joined as that the stage is never left empty, the connection is said to be observed.

Connectives, in Grammar, one of the four species under which, according to Mr. Harris, all words may be included. They are of two kinds, and as they connect sentences or words, are called by the different names of Conjunctives and Prepositions. Hermes, p. 311, and 237.

Connectsville, in Geography, a town of America, in the county of Washington and state of Pennsylvania, pleasantly situated on the Ohioginay, settled about ten years, and containing about 80 houses and 400 inhabitants.

Conner, A. See Ale-Conner.

Connere, in Geography, a town of France, in the department of the Sarthe; 4 leagues E.N.E. of Le Mans.

Connectable or Connétable de France, contable of France. In the origin of this title, the connetable, who succeeded the grand seigneur of France, was considered as one of the first demesnes of the French kings, in short as master of the hawks. Afterwards he became the first officer of the crown, chief and conductor of the armies, first ferjeant of the king for executing his orders and commands; for laying hands on the grandees, imprisoning them, and representing them in justice. This employment became by degrees so eminent, that the marshals of France were only lieutenants. This office was abolished in the reign of Louis XIII. Anne de Montmorency, who lost his head on a scaffold, was the last who filled it.

Connétable de France. This was a particular corps under the orders of the seigneors marshals of France, and consisted of 48 guards on horseback.

Connie, in Geography, a small river of France, in the department of Eure and Loir, remarkable for being so completely dried up in winter, that the fish are obliged to hide themselves in the cavities where there is a little water remaining; in summer, on the contrary, its stream is always copious.

Conneventes Valvule, in Anatomy, are folds of the internal, or villous coat, of the small intestine. See Intestine.

Connoie Bay, in Geography, a bay on the S. coast of Newfoundland, 50 miles E. of Cape Bay.

Connoisseur, a French term, of late use in English; it literally denotes a person well verfed in anything; being formed of the verb connaitre, to know, understand. Hence it comes to be used in our language as a term, or person who is a thorough judge, or master in any way, particularly in matters of painting and sculpture.

Connon, in Geography, a river of France, called also Aa, which runs into the Beuvron, six miles S.E. of Beuvron.

Connor, Bernard, in Biography, a native of Dublin, in Ireland, where he was born in 1666, received his education at an academy in France, and at a proper age was sent to Montpelier, where he was made doctor in medicine in the year 1690. He was soon after engaged to superintend the education of two young Polish noblemen, with whom, after residing some time at Paris, he travelled over Italy, and the island of Sicily, and then went to Poland, where he was appointed physician to the king. This did not, however, detain him long in Poland, as we find him practising in London, and made fellow of the College of Physicians, and of the Royal Society, in the year 1696. He had published, the preceding year, "Diferentiarum Medicop-Physicarum de Antiquis lecitarns, de Montis Vefuvii incendio, de lupendo offium coelain,. OXONI, 1696." He had seen, while in Italy, an eruption of Mount Vesuvius, and had visited the Grotto del Cano, of both which he gives descriptions, and of a skeleton, in which the vertebrae, ribs, and osa innominata, were all firmly united. "Tentamen Epistolare de Secretione Animalium," in which he attempts to account for the difference in the colour, taste, and other sensible qualities of the humours, secreeted from the blood. "Evangelium Medicum, feu Medicina MyFFica de sufpenfis Naiure legisb, Lond. 1697, 8vo." and in 1698, in the latter part of which year he died, "A Compendious Plan of the Body of Physic," apparently a text-book, from which he had given, or had proposed giving, a course of lectures. To this work he added, a short, but entertaining, account of Poland. Haller. Bib. Med. Eloy. Dict. Hum.

Connor, in Geography, a village in the county of Antrim, Ireland, that gives name to a bishopric which was united to that of Down in 1454, and which extends over most of the county of Antrim. It contains 395,000 Irish acres, which are divided into 76 parishes; but from unions, there are only 40 benefices and 45 churches. The church of Limalburn, was, by letters patent of James I, made the cathedral, that of Connor is in ruins. Connor is 67 Irish miles N. from Dublin, and 17 N. from Belfast. Beamont.

Connor, a river of the island of Jamaica, which runs into the sea, between Rocky point, and port Morant.

Connthal. See Caverium.

Cono, in Commerce, a Florence wine measure of 10 barrels, each barrel being about 12 gallons.

Conobea, in Botany, Abbr. See Conopea.

Conocarpedendor. See Protea and Pius.

The text appears to be a natural reading of a botanical description. It includes descriptions of flowers, leaves, fruit, and distribution. The text is relatively self-contained, discussing the characteristics of a particular plant species. The language used is formal and technical, typical of botanical literature. The text mentions features such as flowers, leaves, fruit, and distribution, providing a detailed description of the plant in question.
their common intersection being $AC$; let $GH$ be any other line meeting the generating section in $G$ and $H$, and intersecting $AC$ in $E$; and erect $EF$ perpendicular to the plane $ABC$ and meeting the proposed plane in $F$. Then, if $AC$ and $GH$ be conceived to move continually to themselves, the rectangle $AE \times EC$ be to the rectangle $GE \times EH$, always in a constant ratio; but if $GH$ be perpendicular to $BD$, the points $G$, $E$, $H$ will be in the circumference of a circle whose diameter is $GH$, so that $GE \times EH = EF^2$; consequently, $AE \times EC$ will be to $EF^2$; always in a constant ratio; and therefore $ACF$ is a conic section, and every section parallel to $AFC$ will be of the same kind with, and similar to it.

Hence.

1. The above constant ratio, which $AE \times EC$ has to $EF^2$, is that of $K\mathfrak{t}$ to $L\mathfrak{t}$, the squares of the diameters of the generating section respectively parallel to $AC$, $GH$; that is, the ratio of the square of the diameter parallel to the section to the square of the revolving axis of the generating plane. This will appear, by conceiving $AC$ and $GH$ to be moved into the positions $KL$, $MN$, intersecting in $I$, the centre of the generating section.

2. It appears also that the axis $AC$ and $2EF$ of the section, supposing $E$ now to be the middle of $AC$, will be to each other, as the diameter $KL$ is to the diameter $MN$ of the generating section.

3. If the section of the solid return into itself, it will evidently be an ellipse. This always happens in the spheroid, except when it is perpendicular to the axis; which position is also to be excepted in the other solids, the section being always a circle; in the paraboloid, the section is always an ellipse, excepting when it is parallel to the axis; and in the hyperboloid, the section is always an ellipse, when its axis makes with the axis of the solid an angle greater than that which the said axis of the solid makes with the asymptote of the generating hyperboloid: the section being an hyperbola in all other cases, except when those angles are equal, and then it is a parabola.

4. If the section be parallel to the fixed axis $BD$, it will be of the same kind with, and similar to, the generating plane $ABC$; that is, the section parallel to the axis, in a spheroid, is an ellipse similar to the generating ellipse; in the paraboloid, the section is a parabola similar to the generating parabola; and in an hyperboloid, it is a hyperbola similar to the generating hyperboloid of the solid.

5. In the spheroid, the section through the axis is the greatest of the parallel sections; in the hyperboloid, it is the least; and in the paraboloid, all the sections parallel to the axis are equal to one another. For the axis is the greatest parallel chord line in the ellipse, but the least in the opposite hyperbolas, and all the diameters are equal in a parabola.

6. If the extremities of the diameters, $K$, $L$, $M$, $N$, be joined by the line $KN$, and $AO$ be drawn parallel to $KN$, and meeting $GEH$ in $O$, $E$ being the middle of $AC$, or $AE$ the semi-axis, and $GH$ parallel to $MN$; then will $EO$ be equal to $EF$, the other semi-axis of the section. For, by similar triangles, $K:1 = IN::AE:EO$. Or, upon $GH$ as a diameter describe a circle meeting $E$, perpendicular to $GH$, in $Q$; and $EQ$ is evidently equal to the semi-diameter $EF$.

7. If $AP$ be drawn parallel to the axis $BD$ of the solid, and meet the perpendicular $GH$ in $P$, it will be evident that, in the spheroid, the semi-axis $EF = EO$ will be greater than $EP$; but in the hyperboloid, the semi-axis $EF = EO$ of the elliptic section, will be less than $EP$.
pay; the general hastened to the court of Persia, but was not followed to approach the sovereign, unless he submitted to a species of adoration very strange to a noble and dignified mind; this he resisted, and though denied an audience with his majesty, his remonstrances produced the desired effect, and he was allowed to nominate his own treasurer to the fleet. Conon refused his command, attacked the Spartan admiral Pheidon, whom he killed with his own hand; the Spartans were defeated with the loss of fifty ships, and the rest were glad to seek shelter in one of their own ports.

Conon, having thus obtained the dominion of the sea, returned to Athens with plans for restoring his country to its former honours. Scarcely had he begun his operations when he was accused of a misapplication of the royal money, and was apprehended for that and other crimes, for which there appears to have been little or no foundation. He did not, however, survive the accusation; but the manner and particular time of his death are not known, though it was suspected that he was safely murdered in prison.

Plutarch. Univ. Hist.

Conon, a mathematician of considerable celebrity at Samos, flourished about three centuries, and died about the year 223 B.C. He was a contemporary and friend of Archimedes, to whom he communicated his writings, and solved some problems, which Archimedes received with approbation, willing them to be published during the lifetime of his author, in order that from them they might receive a just demonstration. Conon made many observations on the eclipses of the sun and moon, and gave the name to the constellation called Coma-Berineses. His death happened during the period when Archimedes flourished, whose eulogium for his friend has come down to the present times: speaking of his great genius, he asks: "How many theorems in geometry, which to others seemed impossible, would, had Conon lived, have been brought to perfection?" Conon invented a spiral, the properties of which having been demonstrated by Archimedes, it has obtained the name of Archimedes's spiral. He is referred to with respect in the writings of Propertius and Virgil. Hutton. Moreri. See Conic Sections.

Conon, Porz, was by birth a Thracian, and educated in Spain, from which place, where he was ordained presbyter. Upon the death of pope John V., the disputes respecting a fiscullor ran so high, that for three months the papacy was vacant: the clergy espousing the interests of one candidate, and the army declaring for another. At length Conon was fixed upon, who proved acceptable to all those in whom the appointment was vested. He ascended the pontifical throne in the year 686, and died in about a year, but left behind him a character rarely attained by those who have filled that high station. His piety, learning, integrity, and fluavity of manners, were exemplary, and justly celebrated. There was also a cardinal of this name, a native of Germany, and advanced to his high rank in the church by pope Pafcal II. He was the avowed and intrepid defender of the high claims of the Roman see, and, on this account, fetected as a proper person to preside at the council of Jerusalem, in which Henry V., emperor of Germany, was excommunicated, for not submitting to the pope's allured right to the interdicture of bishops and abbots. He was afterwards legate at the council of Soissons, in the year 1141, when the death of the celebrated Adlard, on the Unity of God, was so wrung as to be burnt. Conon, it is believed, might have been elected to the popedom on the death of Gelarius, an honour which he declined for motives not now known. His own vote and interest he gave to Guy, archbishop of Vienne, who was elected pope, and assumed the name Callistus II. Moreri.

CONONIS A.R., in Ancient Geography, a place of Ethiopia, upon the Arabian gulf, according to Strabo; near port Main.

CONONITIS, in Ecclesiastical History, the followers of Conon of Alexandria in the sixth century, resembling in their opinions the Armenian, Thodosiani, and Triphians.

CONOPA, in Ancient Geography, a lake of Greece, in Etolia, afterwards called Gynea — Allo, a town of Greece, in Acarnania, according to Steph. Byz. and Polybius. Strabo says, that the town of Allo was, which he places in Etoia, had in former times been called Conopa.

CONOPEA, in Botany, (esp. in sect. a.) a seed, or to keep off gnats), Mart. (Conobea; Wild. Jull. 97. Abrl. Guian. 2. 630. tab. 257.) Clafs and order, didynamia angustiformia. Nat. Ord. Leguminosae, Jull.

Gen. Ch. Cal. perianth one-leafed, five-angled, permanently five-cleft; segments somewhat egg-shaped, acuminate, erect. Cor. one-petalled, ringent; tube oblong, gradually widening; border two lipped; upper lip erect, emarginate; lower lip trident, the middle segment larger, concave. Stam. filaments four, attached at the bottom, to the tube of the corolla; anthers arrow-shaped, Fl. Germ. roundish; style filiform, hairy; Stigma two-lobed. Peric. Capsule roundish, one-celled, four-valved. Seeds numerous, small, fixed to a roundish receptacle.


Species. C. aquatica, a creeping plant, growing naturally near water, spreading over its surface, and the grains near the banks, throwing out small fibrous roots from the joints. Stems and branches square, each angle bordered by a very sharp ring. Leaves at each joint, opposite, embracing the stem, kidney-shaped, plated at the nerves, undulated at the edge. Flowers blue, axillary, either solitary or in pairs; peduncle an inch long, slender; calyx with two long, narrow, pointed leaves at the base. Capsule with four grooves, partly enclosed by the calyx. A native of Guiana.

CONOPAEUM, in Antiquity, a sort of canopy of network, which hung above beds, and was designed to keep away gnats or flies; it comes from Κονόπα, a fly. A piece of furniture of this kind is now used in the East; and Mr. Harmer (Obs. on Scripture, vol. iv. p. 405.) figures, that if it obtained there at so early a period as the time of Saul, it may serve to illustrate a passage of Scripture, ver. 1 Sam. xix. 12—17. This writer supposes that the word translated "a pillow of goats-hair," meant a conopeum or guard against gnats. It is in one place translated a "thick cloth," and in another a "veil." Mr. Harmer observes, that a cloth of a nature fit to be used as a veil, is just such a thing as a conopeum, or fine net-work or gauze-like cloth. It appeared to be something relating to the head; but a conopeum relates to the head as well as a pillow, being a canopy suspended over the whole bed, or at least so far as to surround the head, and such upper part of the body as might be uncovered. That this kind of defence against gnats is now used in the East, Mr. Harmer has shewn, from the testimony of Maillet (Descrip. de l'Egypte, lett. iv. p. 37.) The word occurs probably in the same sense in 2 Kings, viii. 15.

CONOPAEUM, in Ancient Geography, a marsh of A sia, near the mouth of the river Halys, according to Arrian—Allo, a particular part of the Palus Maeotis. Steph. Byz. CONOPHORUS,
CONOPHORUS, in Botany, Petiv. Rai. See Protea Nana.

CONOPOLI, in Geography, a town of European Turkey, in the province of Livadia, 10 miles N.E. of Lepanto.

CONOPS, in Entomology, a genus of dipterous insects, the mouth of which is furnished with a projecting geniculate probosces, and the antenna elevated and pointed at the end.

The insects of this genus are remarkably active, and are found in gardens, where they feed on the nectaraceous juices of flowers; their larvae are unknown. In the true conops, the head is large and nearly hemispherical; the eyes large, and almost oval, and the antenna formed of three articulations, the middle one of which is long and cylindrical, the last joint terminating in a little point.

The genus conops is divided in the Linnaean system into two families; the first of which includes those species which have the sheath of the suckor single-valved, abbreviated, and inclining a single bristle; the other those with the sheath consisting of two equal valves, and which is genculated both at the base and in the middle. The latter are those of Fabricius. In the Fabrician Suppl. Ent. Syll. the Linnaean conops subcocleatus is decribed under the new genus, thereva.

Species.

* First Section.

** Vesicularis.** Blackish; hind head veicular, abdomen yellow with a black base. Fabr. Geoffr. Inhabits woods in Europe.

** Macrockapha.** Black; four of the abdominal segments edged with yellow; antennae and legs rufous. Linn. Like the last inhabits Europe, and is found in woods.

** Rufipes.** Deep-black; abdomen at the base ferruginous; segments edged with white; legs ferruginous. Fabr.

This species is a native of Germany. The rib of the wing, and the antennae are fuscous, front and posterior yellow.

** Aculeata.** Deep-black; inciures of the abdomen yellow; thorax with two yellow dots on the anterior part. Linn. Fr. Suec. A native of the northern parts of Europe.

** Flavipes.** Glossy-black; abdomen cylindrical; three of the segments edged with yellow. Linn. Fr. Suec. This inhabits Europe, and has the legs fasciated with yellow, whence its name.

** Picta.** Ferruginous; thorax black, varied with yellow, rib of the wing ferruginous. Fabr.

A native of the American islands, described from the cabinet of Smith.

** Vitata.** Abdomen cylindrical, hooked, and varied with ferruginous; an abbreviated sub-marginal black spot on the wings. Fabr. Inhabits Sicily.

** Second Section.

** Ferruginea.** Ferruginous; abdomen cylindrical and incurved; front yellowish. Linn. Sicus ferrugineus, Scop. Inhabits woods of Europe.

** Petiolaris.** Antennae black, the club red; head yellow; abdomen petiolate. Fabr. A native of Siberia.

** Astomaria.** Grey; abdomen ovate; wings fuscos, with crowded dots of white. Gmel. An European species.

** Testacea.** Ferruginous; thorax black on the back. Fabr. Stromaexides, Schaff. Found in Germany.

** Atea.** Abdomen cylindrical and incurved; body black. Fabr. Inhabits woods of Denmark.

** Cincta.** Tereteous; abdomen hooked and fasciculated with white. Fabr. A native of the East Indies. Koenig.

** Bucata.** Ferruginous; abdomen hooked, grey; face veicular and white; wings clouded. Linn. Fr. Suec. Sicus bucatus, Scopoli. Inhabits woods of Europe.

** Anulata.** Thorax black; abdomen cylindrical, varied with yellow and black; base of the wings ferruginous; legs ferruginous and annulated with brown. Linn. A native of Europe.

** Flava.** Thorax black; base of the abdomen black on the back, with a black mark each side, and the two next segments with an oblique black spot in the middle and at the sides. Linn. An European species.

** Cinerca.** Ferruginous; mouth veicular and white; tail black. Fabr. Described from a specimen in the cabinet of Dr. Aliomi. It is a native of Italy.

** Dorsalis.** Ferruginous; thorax fuscous on the back; abdomen cylindrical and hooked; margin of the segments white. Fabr. Myopia fuscata, Mant. Inf. Inhabits Germany. Smidt.

CONOPONDIA BASSIS, in Ancient Geography, a name given by Philip to an island at the mouth of the Danube, which the ancients called Pheidolema.


** Gen. Ch. Cal. one-leaved, deeply five-cleft; segments lanceolate, acute. Cor. Petals five, ovate-oblong, erect, doubled, forming a tube, acute, expanding or reflexed at their summit, attached to the receptacle of the pilli; accompanied by five interior, smaller, erect, lanceolate, concape, petal-like bodies placed opposite to them. (Nectaries?) Stam. Filaments five, very short, attached to the base of the petal-like bodies; anthers erect, oblong. Pfl. Germ superius, roundish; style slender; stigma capitate. Pericarp unknown. Sp. C. flaveum. Aubl. Guian. tab. 95. A shrub, three or four feet high, with numerous, scattered, knotty, compound branches near the top. Leaves opposite, on short petioles, egg-shaped, acute, entire, smooth, green above, reddish underneath, the largest of them six inches long, and near three inches broad. Flowers yellowish, alte nata, in spikes terminating the branches, and surmounted with scales at the base; peduncles with two, small, opposite scales about the middle. A native of woods in Guiana.


Gen. Char. Cal. none. Cor. monopetalous, ringent, four-cleft; tube swelling; upper lip vaulted, undivided; lower, in three equal, spreading segments. Stam. four. Anthers selle, fingle-celled, two in the hollow of the upper lip; two, which often seem abortive, at the base of the lower, remote from each other. Pfl. German superius, inversely conical, bearded at the summit. Style linear, bent, shorter than the corolla. Stigma obtuse, curved. Seed solitary, naked, inversely conical, its upper edge fringed with numerous, spreading, filaments; about its own length.

Ell. Char. Calyx none. Cor. of one petal, ringent, bearing the flamen; its upper lip vaulted; under three-cleft. Stigma obtuse. Seed one, naked, crowned with bristles.

Observ. Considering the irregularity of the flower, and the inequality of position of the anthers, perhaps this genus might be placed in didynamia gymnospermia, in which order...
it would add one to the very few genera that have left no
four seeds; but it has no affinity to any already chiled
there, being nearly allied to that tribe of 
"praise" whose flowers are simple, not aggregate; and as the authors are
all really wild, it could not literally accord with the definition of the 14th clus.
"Leaves linear, inclined to oblong, entire, smooth, with
a marginal nerve, and numerous transverse veins. Sm. Stem
thorzy, rigid, branched, about three feet high, with round
leafy branches, which are filky when young. Leaves alter-
nate, several inches long, entire, smooth, varying in breadth
from a linear to a narrow oblong figure, tipped with a small
point, and tapering at the base, into a longish slender foot-
stalk. Their margin is marked with a fine nerve, connected
by transverse veins with the midrib. Stipules none. Flower-
fucks about the tops of the branches, axillary, much exceed-
ing the leaves in length, each bearing a large bracteated
downy corymbus, of white or bluish-coloured, filifie, clus-
tered flowers. Bractae membraneous, wedge-shaped, pointed
fringed. Corolla about a quarter of an inch long, externally
downy. Seeds inerably conical, or top-shaped, brown, downy,
crowned with a marginal row of spreading redshin bristles,
and altogether resembling a antique. A native of New
South Wales, and other parts of New Holland; not yet
brought to Europe. The flowers are generally seen in the
aspect of the whole shrub not ingetent. 2. C. ellipticum.
"Leaves elliptical, rough, edged." Sm. MSS. A mere
humble and divaricate shrub than the former. Branches
hairly when young, thickly clothed with leaves, which are
about three quarters of an inch long, crowded, nearly fel-
ife, elliptical, obtuse, entire, thick, and apparently succu-
cent when fresh, concave when dry, single-rubbed, veined,
roughish underneath, especially at the edges, tipped with
a minute point. Flower-stalks situated as in the foregoing,
but shorter, and more crowded; very downy, as is likewise
the outside of the corolla. Seed rather smaller than the last.
Sect from New South Wales by John White, M.D. 3. C.
taxifolium. "Leaves linear-lanceolate, oblique, somewhat
downy." Sm. MSS. Branches long and wand-like, very
leafy, filky. Leaves imbricated, scattered, filifie, nearly an
inch long, linear-lanceolate, inclining to oblong, oblique,
narrow, rigid, pointed, single-rubbed, veined, thick-edged,
entire, for the most part clothed with short filky hairs
rarely smooth. Flowers situated as in the two species pre-
ceeding, in a dense leafy corymbus at the end of each branch, but their filkis are left compound. In general
aspect and structure they areem, as well as the food, to agree
precisely with those of C. ellipticum. Gathered also at New
South Wales by Dr. White. 4. C. crieffolium. "Leaves awl-
shaped, keeled, smooth." Sm. MSS. This has very much
the habit of the last, and their flowers and seeds exactly ac-
cord. Both seem to be rather herbaceous than shrubby,
though they have the hard rigid texture so frequent in New
Holland plants. This is the smaller of the two. Its leaves
are fearcely more than half an inch long, imbricated, awl-
shaped, obtuse, keeled, and somewhat triangular, tipped as
in the last with a small point, roughish occasionally to the
touch, but, as far as we can discover, always defluent of
pubeference, though the branches are filky. Gathered at
New South Wales by Dr. White. 5. C. reticulatum.
"Leaves wedge-shaped, jagged, reticulated on both sides." Sm. MSS. The fibres appear to be herbaceous and pro-
cumbent, leafy, hairy, a few inches in length. Leaves about
three inches long, alternate, erect, wedge-shaped, entire at
the sides, dilated and jagged at the extremity, veiny, beau-
tifully reticulated on both sides, tapering down at the base
into rigid, furrowed, hairy footstalks, about their own
length, whose bases are dilated, and bordered with a mem-
broaneous sheathing lipula. Flower-stalk terminal, two or
three together, hairy, erect, scarcely in falt as the leaves,
each bearing a loole, bracteated, single spike of downy,
apparently white, flowers, whose segments are more ob-
tulate than in the other species. The most remarkable char-
acter of C. reticulatum consists in the exquisitely reticulated
veins, prominent on both sides of the leaf, branching off
from the main ribs and veins, and forming a fine regular
uniform net-work over the whole surface, whose interfaces
are commonly pentagonal, and not more in diameter than
grains of common sand. The veins themselves are finely
hairy. For dried specimens of this most beautiful species
we are indebted to Mr. A. Menzies, who discovered it at
King George's Sound, on the west coast of New Holland,
at. 35. Its fruit we have not seen, but there can be no
doubt of its genus.

CONOSTEIN-Engers, or Engers, in Geography, a town of
Germany, in the circle of the Lower Rhine, and elec-
torate of Treves; 4 miles N. of Coblenz.

CONOTHATON, in Ancient Geography, an episcopal see
of Alsia, under the metropolis of Biiriat. CONON, in Geography,
a town of Persia, in the province of Luristan, on the coast of the Persian gulf; 66 miles E.S.W. of Lar.

CONOVITUM, in Ancient Geography, a town of the isle
of Albion, on the route from Segontium or Caernarvon
to Deva or Chester, according to Antonine's Itinerary.
It was distant 24 miles from Caernarvon, and is now called
Caer-Rhyn.

CONQUASSATION, in Pharmacy, a species of comminu-
tion, or a particular operation, by which moist concreted
substances, such as recent vegetables, their roots, lactescent
seeds, and the softer parts of animals, are contused and agi-
tated in a mortar, until partly by their proper succulence,
or the affusion of some liquor, they are reduced to a soft
pulp. Metallic instruments are not to be used for this pur-
pose, because not only the manifest, but also the latent
faits of the substances, subjected to this operation, acting on
the instruments, may derive an adventitious virulent quality from
them, which will not only render such substancess unfit for
the intended purpofes, but also nauseous and hurtful when
exhibited as medicament by incer.

CONQUERORS, in French Conquerant. A captain or
commander who has subdued several cities or entire countries
by force of arms. Alexander the Great, Julius Caesar,
Tamerlane, Mahomet II., &c. were conquerors.

CONQUES, in Geography, a small town of France, in
the department of Aude, and chief place of a canton in the
district of Carcassonne, with a population of 1591 inhabit-
ants. That of the canton amounts to 565, in 10 com-
munes, upon an extent of one hundred kilometres.—Alfo,
a small town of France, in the department of Aveyron,
in the district of Rhodos, with 805 inhabitants, 15 miles N. from
Rhodes. The canton, of which it is the chief place, has
13 communes, with 6597 inhabitants, and measures 187 ki-
nometres and a half.

CONQUEST, in French Conquête, the acquisition of a
place, province, or entire country, by a superiority of
arms, which compels the conquered to submit to the con-
queror.

CONQUEST, in Civil Jurisprudence, is the acquisition
of property in common by a number of persons.
In some countries, they confound acquisition with conquest;
but, according to the most general acceptance, acquisi-
tion is the gaining of unappropriated goods before the efla-
ishment
CONQUEST.

blishment of a community; whereas, by the term conquifit, is ordinarily intended whatever is acquired by a number of persons in community; or by some one for all the others.

As it is more especially in the union of persons by marriage, that a community of property takes place; it is in reference to them that we frequently use the word conquifit. There are, nevertheless, conquests also among other persons who are in a tacit community or society; such as obtain by particular local customs.

According to the sense of the word, it has been contended by several, that William I. claimed this kingdom; that is, not by right of arms, but by right of conquest or acquifit; under promise of succession made by Edward the Confessor, and a contract entered into by Harold, to support his pretensions to that succession; and by old writers, conquestus, acquifitio, and perquisitio, are frequently used as synonymous terms.

In consequence of the prodigious slaughter of the English nobility at the battle of Hastings, and the fruitless insurrections of those who survived, such numerous forfeitures had accrued, that king William was able to reward his Norman followers with very large and extensive poffiffions; which circumstance led the monkifh historians, and such as have implicitly followed them, to represent him as having, by right of the sword, feized on all the lands of England, and distributed them among his own favourites. This supposition is grounded upon a mistaken sense of the word "conquifit," which, in its feudal acceptation, signifies no more than "acquisition"; and hence many party writers have been led into a strange historical mistake, and one, says judge Blackstone, which upon the slightest examination, will be found to be most untrue. See Feudal Tenure.

What we call "purchafe," perquisitio, the feudalists called "conquifit," conquifitio, or conquifitio; both denoting any means of acquiring an estate out of the common course of inheritance. This is still the proper phrase in the law of Scotland; as it was among the Norman jurifths, who fyled the fitst purchaser (that is, the person who brought the estate into the family, which at present owns it) the conqueror or conquifeur. This is all that seems to have been meant by the appellation that was given to William the Norman, when his manner of acceding the throne of England was in his own charter, and in that of his successors; and after by the historians of the times, entitled conquifitio, and himself conquifeur or conquifeur; signifying that he was the fitst of his family who acquired the crown of England, and from whom, therefore, all future claims by descent must be derived; though now, from our difufe of the feudal sense of the word, together with the reflection on his forcible method of acquisition, we are apt to annex the idea of "victory" to this name of "conquifeur," or "conquifitio," a title which, however just with regard to the crown, the conqueror never pretended with regard to the realm of England; nor, in fact, ever had. See PURCHASE.

William the Norman, as we have already observed, and as some have maintained, claimed the crown by virtue of a pretended grant from king Edward the Confeflor; a grant which, if real, was in itself utterly invalid; because it was made, as Harold well observed, in his reply to William's demand, oblique generis featus, et populi conveniunt et edito; and this alto very plainly implies, that it was then generally understood, that the king, with content of the general council, might dispose of the crown and change the line of succession. William's title, however, was altogether as good as Harold's, who was a mere private subject, and an utter stranger to the royal blood. The conquest, then, by William of Normandy, was, like that of Canute before, a forcible transfer of the crown of England into a new family; but, the crown being so transferred, all the inherent properties of the crown were also transferred with it. For, the victory obtained at Hastings not being a victory over the nation collectively, but only over the person of Harold, the only right which the conqueror could pretend to acquire thereby, was the right to pilfer the crown of England, not to alter the nature of the government. And, therefore, as the English laws still remained in force, he must necessarily take the crown subject to those laws, and with all its inherent properties; the fin and essence of which was its indefinability. See Right of Crown.

Some writers have represented William's conquest as more extensive and complete than it has been above stated. Scarcely any of those revolutions, it is said, which, both in history and in common language, have been always denominated conquests, appear equally violent, or were attended with so sudden an alteration of power and property. The Roman state, which spread its dominion over Europe, left the rights of individuals in a great measure untouched; and those civilized conquerors, while they made their own country the seat of empire, found that they could derive the greatest advantage from the subjugated provinces, by securing to the natives the free enjoyment of their own laws, and of their private possessions. The barbarians who subjugated the Roman empire, though they settled in the conquered countries, yet being accustomed to a rude uncultivated life, found a part only of the land sufficient to supply all their wants; and they were not tempted to seize extensive possessions, which they knew how neither to cultivate nor to enjoy. But the Normans came from foreigners, who followed the standard of William, were far advanced in the arts as to know the value of a large property; and therefore having made the vanquished kingdom the seat of government, and having totally subjugated the natives, they pushed the rights of conquest, for the gratification both of their avarice and ambition, to the utmost extremity. Except the former conquest of England by the Saxons themselves, who were induced, by peculiar circumstances, to proceed even to the extermination of the natives, it would be difficult to find, in all history, a revolution more destructive, or attended with a more complete subjection of the ancient inhabitants. In the conduct of their conquerors, continually was blended with oppression; and the natives were universally reduced to such a state of meanness and poverty, that the English name became a term of reproach, and several generations elapsed before one family of Saxon pedigree was raised to any considerable honours, or could so much as attain the rank of baron of the realm. "These facts," says Mr. Hume (Hist. vol. i. p. 287, 5th ed.) "are so apparent from the whole tenor of the English history, that none would have been tempted to deny or clade them, while they were not heated by the controversies of faction; while one party was absurdly afraid of those absurd confquences, which they feared the other party inclined to draw from this event. But it is evident that the present rights and privileges of the people, who are a mixture of English and Normans, can never be affected by a transact which passed 700 years ago; and as all ancient authors, who lived nearest the time, and best knew the state of the country, unanimously speak of the Norman dominion as a conquest by war and arms, no reasonable man, from the fear of imaginary consequences, will even be tempted to reject their concurrence and united testimony."
The Norman invasion, and conquest, as it has been usually denominated, were important events in the history of this country; and produced as great an alteration in our laws, as it did in our ancient line of kings:—and though the alteration of the former was effected rather by the consent of the people, than by any right of conquest, yet that consent seems to have been partly extorted by fear, and partly given without any apprehension of the consequences which afterwards ensued. The alterations in our laws which then took place are enumerated by judge Blackstone; and we shall here subjoin a summary of them. The fall of these was the separation of the ecclesiastical courts from the king, which was effected in order to gratify the new king with the support of the clergy, who had been for some time endeavoured, in every part of Europe, to exempt themselves from the feudal power. This was the more easily accomplished, because the dispoal of all the episcopal fees being then in the breach of the king, he had taken care to fill them with Italian and Norman prelates. The second alteration of the English constitution was more violent, and confined in the depopulation of whole countries, for the purposes of the king's royal diversions; and subjecting both them, and all the ancient fiefs of the king, to the unreasonable severities of the laws imposed from the continent, by which the slaughter of a beast was made almost as penal as the death of a man. (See Forest and Game.) A third alteration in the English law was effected by narrowing the remedial influence of the county courts, the great feats of Saxon justice, and extending the original jurisdiction of all the king's judges to all kinds of cases arising in all parts of the kingdom. (See Acta regia.) Hence all proceedings in the king's courts were ordained to be carried on in the Norman, instead of the English language; a badge of slavery as evident and signal as ever was imposed upon a conquered people, which lasted till King Edward III. obtained a double victory, over the armies of France in their own country, and their language in our courts here at home. A fourth innovation was the introduction of the trial by combat, for the decision of all civil and criminal questions of fact in the last resort. (See Combat.) The last and most important alteration, both in our civil and military polity, was the enfranchising all landed estates, a few only excepted, the fiction of feudal tenure; which drew after it a numerous and oppressive train of servile fruits and appendages; aids, reliefs, primer feines, wardships, marriages, ecchates, and fines for alienation; the genuine consequences of the maxim then adopted, that all the lands in England were derived from, and held, mediately or immediately, of, the crown. See each article respectively, and Feudal Tenure.

"The nation at this period," says judge Blackstone, "seems to have groaned under as absolute a slavery as was in the power of a warlike, ambitious, and a politic prince to create. The confinences of men were enslaved by four ecclesiastics, devoted to a foreign power, and unconnected with the civil state under which they lived:—who now imported from Rome for the first time the whole fury of superstition, and Norman conquest; such as transubstantiation, purgatory, communion in one kind, and the worship of saints and images; not forgetting the universal supremacy and dogmatical infallibility of the holy see. The laws too, as well as the prayers, were administered in an unknown tongue. The ancient trial by jury gave way to the impatient decision by battle. The forest laws totally re-framed all rural pleasures and manly recreations. And in cities and towns the cafe was no better; all company being obliged to disperse, and fire and candle to be extinguished by eight at night, at the found of the melancholy curfew. The ultimate property of all lands, and a considerable share of the prent profits, were vested in the king, or by him granted to his Norman favourites; who, by a gradual progression of slavery, were absolute vassals to the crown, and as absolute tyrants to the commons. Unheard of forfeitures, tallages, aids, and fines, were arbitrarily exacted from the pillaged landholders, in pursuance of the new system of tenure. And to crown all, the consequence of the tenure by knight-service, the king had always ready at his command an army of 60,000 knights, or militia; who were bound, upon pain of confiscating their estates, to attend him in time of invasion, or to quell any domestic insurrection. Trade, or foreign merchandise, such as it then was, was carried on by the Jews and Lombards; and the very name of an English fleet, which king Edgar had rendered so formidable, was utterly unknown to Europe; the nation confiding wholly of the clergy, who were also the lawyers; the barons, or great lords of the land; the knights, or vassals, who were the subordinate land-holders; and the burghers, or inferior tradesmen, who from their insignificance, happily retained, in their foage and burgage tenure, some points of their ancient freedom. All the rest were vassals or bondmen."

"From so complete and well-concerted a scheme of servility, it has been the work of generations for our ancestors, to redeem themselves and their posterity into that state of liberty, which we now enjoy:—and which therefore is not to be looked upon as confining of mere encroachments on the crown, and infringements on the prerogatives, as some dulvish and narrow-minded writers in the last century endeavored to maintain:—but as, in general, a gradual reformation of that ancient constitution, whereof our Saxon forefathers had been unjustly deprived, partly by the policy, and partly by the force, of the Norman." Blackl. Com. Book iv. See Constitution.

Conquest, in the Law of Nations, is the acquisition of sovereignty by force of arms, by some foreign prince; who reduces the vanquished under his empire. The right of conquest is derived from the laws of war; and when a people is subjected, the conduct of the conqueror is regulated by four kinds of law. First, the law of nature, which dictates whatever tends to self-preservation; secondly, the reason, which teaches us to use others, as we would be treated ourselves; thirdly, the laws of political society, to which nature has not assigned any precez boundary; lastly, the law which is derived from the particular circumstances attending the conquest. Thus, a state conquered by another will be treated in one of the four methods following: Either the conqueror will continue it under its own laws, and will only claim the exercise of civil and ecclesiastical sovereignty; or he will impose a new form of government; or he will destroy the frame of their society, and incorporate the inhabitants with others; or he will exterminate them. Ancient and modern history will supply numerous instances of these different modes of treatment. See Colony and Plantation.

The right of conquest is allowed by the law of nations, if not by that of nature; but in reason and civil policy it can mean nothing more than that, in order to terminate hostilities, a compact is either expressly or tacitly made between the conqueror and the conquered, that if they will acknowledge the victor for their master, he will treat them for the future as subjects, and not as enemies. Puffin. Ls. of Nat. viii. b. 24.
CONQUET, L., in Geography, a pretty, rich, small town of France, in the department of Finlere, with a noble history, and excellent roads; 15 miles west from Brest. It is one of the 84 maritime quarters into which modern France is divided, and the residence of a maritime faction who desist from this place, besides Argenton, Lor- spered, and Oeufant.

CONQUER, or CONQUERED, a name of Holland, who was born about 1620. The works of this artist, for the greater part, con- of portraits, many of which are from his own drawings, of prints very much rembale to those of L. Voller- mance. Amongst his belt works the following may be enumerated: "Christopher Love," A. Conrad, fol, in fol.; "Jacob Triglande, Professor of Theology to the University of Leyden," Ab. Conradus, feit, in fol.; "The Proclamation and the Crucifixion of Christ," two plates in folio, from Ab. Van Driekenbeek. Huber, Manuel des Arts.

CONRAD I., emperor of Germany, was, previously to his attaining that high honour, duke of Franconia and Hesse. On the death of Louis IV., king of Germany, A.D. 912, the nobility of the realm assembled at Worms, for the pur- pose of choosing a successor. They offered the crown to Otho, duke of Saxony, by whom, on account of his great age, it was not accepted. He requested them to turn their thoughts to the duke of Franconia, who was highly esteemed for his great talents and excellent character. Upon this re- commendation he was called to the vacant throne, though not with that unanimity which is calculated to secure gen- eral homage. The people of Lorrain were attached to Charles the Simple, whom they wished to proclaim as their sovereign; Conrad marched thither with great expedition, and by his presence conciliated those who were disposed to refit his authority. While he was thus engaged, Henry, duke of Saxony, occupied the city of Worms, and raised the rebellion. This, after sur- mounting several difficulties, he crushed, and gained a com- plete victory over his enemies. The Hungarians now made a dreadful irruption into his dominions, and, after marking their progreswith fire and sword, compelled him to pur- chase a peace on very disgraceful terms: but, notwithstanding all the exertions of his enemies, he retained the sceptre, and conducted the affairs of the empire with con- siderable prudence till the time of his death. His constitut- tion being broken by the fatigues to which he had been ex- posed, and his health being much injured in consequence of a wound which he had received in battle, he assembled the princes and states of the empire, and firmly exhorted them to raise Henry, duke of Saxony, who had been his enemy, to the imperial throne. This is a rare instance, on the rec- ords of history, of a prince sacrificing his private resent- ment to the public good. He sent the crown, sceptre, and other regalia to his intended successor; and after an active and respectable reign of seven years, he died, A.D. 918, in peace, in one of the situations of quitting life under the influence of Christian principles.

CONRAD II., emperor of Germany, was likewise duke of Franconia; he was surnamed the Salic, on account of his having been born on the banks of the river Sala, and was unanimously invested with supreme authority. He succeeded Henry II., and was crowned, according to ancient usage, at Thoma. During the first two years of his reign, Conrad was chiefly employed in regulating the police, and other affairs of administration; but in the third, receiving intelligence that the Lombards had shaken off their allegiance, he was obliged to march into Italy. The rebels were soon reduced to obedience, and the king pro- ceeded to Rome, where he was solemnly crowned by pope John, in presence of Carute, king of England and Den- mark, and Rodolphus, king of Burgandy. He was re- called to Germany, on account of an insurrection, raised by the dukes of Swabia, Carinthia, and Worms, which he readily suppressed, and brought the offenders to the lowest state of subjection. By a decree of the empire, they were deprived of their dominions. The seven succeeding years were occupied by wars between the emperor, Poland, Bohemia, and Hungary: the details of these would be un- interesting to our readers. The imperial arms were in general successful; and on the demise of Rodolphus, Conrad ac- quired the peaceable possession of the sovereignty of Bur- gundy. A general war, however, broke out between Germany and Austria, which was planned in Italy, and fomented by many leading persons: the emperor passed suddenly into that country, and feizing some of the principal mainsprings, sent thither mon- etor to Germany. He besieged Milan, but without suc- cess; and severely chastised Parma. Being urged by the monks of Calzino to protect them against the violence and oppression of Pandolph, prince of Capua, he marched to that place, expelled the prince, and feized his country. Returning to Germany, he was feized with the gout in his legs, and died suddenly at Utrecht, in 1039, in the fifteenth year of his reign. He was universally revered as a just and magnificent prince; and all those who distinguished themselves in his service had no reason to be dissatisfied with the remunerations which they obtained. Among many in- instances of his munificence, it is said that one of his attend- anti, who had lost his leg in battle, received a boot full of gold, which the emperor observed might defray the expense of his care. He was interred in the cathedral church of Spira, which he had formerly founded. To III., another younger duke of Franconia and emperor of Germany, was nephew of the emperor Henry V., and elected to the imperial throne at Coblenz in 1035-9, as successor to Lothair II. This measure was warmly con- tented by Henry, duke of Bavaria, who positively refused to surrender the regalia, which had been deposited in his hands by Lotharius. He was, however, at length compelled to submit, with the loss of his own dominions; and the disappoin- tement and chagrin which he suffered on the occasion brought him to an early grave. Upon the death of this prince, his brother Guelph, with the assistance of the king of Sicily, made vigorous efforts for the recovery of the confiscated dukedoms: a war ensued, and, after several inde- cissive engagements, the duke was closely besieged by the emperor in the castle of Weinsberg, celebrated for the con- jugal fidelity and affection of the ladies; who, being per- missioned to leave the place with whatever they could carry, marched out, each with her husband on her back. This in- stance of kindness and regard so much affected the emperor, thnady, he readily came into terms with Guelph and his partizans.

In this war we must look for the origin of the dis- unities of the Guelphs and Ghibellines, which are so often referred to on the page of history. The troubles in Ger- many were immediately succeeded by a revolt of several of the
the town of Italy, which threw off the sovereignty of the empire, and formed themselves into independent republics. Conrad was now prevailed on to join a crusade against the Saracens, and took the cross from the hands of Bernard. He accordingly set out for Palestine, at the head of sixty thousand men. Under his banners a troop of females rode in the attire and armour of men; and the chief of these Amazons, from her boot spurs and buckles, obtained the epithet of the "golden-booted dame." This expedition proved unfortunate: one half of his troops perished by sickness, occasioned, it is believed, through unworthy provisions, furnish by the treachery of the Greek emperor, Manuel Comnenus. Conrad, with the remainder, joined Louis VII. king of France, in the siege of Damascus, exhibiting great provails, but without any success. The siege was raised, and the emperor returned to Germany, where he was overwhelmed with public calamity and private affliction, by another revolt of Guelph, and by the death of his eldest son. This last event preyed on his mind, and evidently affected his health. Aware of his approaching end, he was anxious to provide for the succession, and recommended his nephew, Frederic Barbarossa, to the flates of the empire, as a prince of known courage and tried talents. His recommendation was approved, and Conrad died in a short time after, at Bamberg, in the 14th year of his reign. He left one son by his empress Gertrude, whose tender age precluded him from taking any share in the government.

CONRAD IV., the last emperor of Germany of this name, was duke of Suabia, and son of the emperor Frederic II. He was declared successor to his father in 1250, but pope Innocent IV. refused to confirm the election. Conrad, notwithstanding the denunciations of the pontiff, marched into Italy, in order to take possession of the kingdom of the two Sicilies, which had been bequeathed to him by his father. He took the city of Naples after an eight months' siege; afterwards Capua and Aquino opened their gates to him. He did not long enjoy his success: in 1254, he fell sick, and died in the flower of youth, leaving one son, named Conradin, who, at the age of fourteen, was beheaded by the orders of Charles of Anjou; and in his place, his elder brother, the line of Suabia, Moreri, Unver. Hist. Gibbon's Rom. Empire.

CONRAD is a name distinguished in literary history, as well as among the princes of the earth; but as none of that appellation have become very illustrious by their works, we shall briefly notice them and their writings in a single paragraph. The first was a German abbot of the Benedictine order, about the commencement of the tenth century: he wrote "A Continuation of the History of France;" and on that account has, by some biographical writers, been supposed a Frenchman; by others, he has been confounded with Conrad of Cologne, who was author of the life of St. Wolphlinus. Towards the conclusion of the eleventh century, Conrad, bishop of Utrecht, flourished, to which office he had been raised by his pupil, the emperor Henry. He is chiefly known by a work, entitled, "Apologia de Unitate Ecclesie confervanda, et Schismate inter Henricum IV. Imp. ac Greg. VIII. Pont. Max." He wrote also a spirited defence of the imperial right on the subject of investitures. The bishop was assassinated in his palace, A. D. 1109, by a Friedland archbishop, in revenge for having instructed him in the method of erecting mally buildings on a swampy foil, and afterwards employing a rival in constructing the collegiate church of which the bishop was founder.—Conrad of Sieturn, a German monk, lived in the thirteenth century, and was author of "A Chronicle," and of more than fifty volumes on different subjects, chiefly left in writing of which John of Aventine made much use in composing part of his annals. By his various writings, this monk obtained the honourable epithet of "philosopher."—Conrad of Lichtenau, abbot of Uerberg, in the thirteenth century, was author of "A chronological History," extending from Belus, king of Assyria, to the year 1449, which was afterwards continued, by an anonymous writer, to the reign of Charles V. It was originally printed at Strasburg, in 1527, and afterwards, with the continuation, in 1590, at Boul. It created enemies, by some reflections on the wars carried on between the German emperors and the popes. The same author is said to have written the lives of the saints, in 12 books; but they have not come down to us, and probably were never published.—Conrad of Mentz flourished in the thirteenth century, and is known by a work, entitled, "Chronicon Reim Moguntianum," from the year 1140 to 1250, which was first printed in 1535, and has undergone several different impressions.—About the same period lived Conrad of Marburg, who was the first person of Germany that received the laudable commission of inquisitor from the papal see; an office which he executed with so much cruelty, that at length he fell a sacriifice to the indignation of popular clamour. He wrote "The Life of the Princess Elizabeth of Thuringia," who has obtained a place among the saints.—Conrad is the name of two Dominican monks, natives of Saxony, in the fourteenth century. One was a member of the chapter of his order in that province, and the other appointed by the pope vicar-general of Saxony, in the year 1350. The former published, among many other things, "A Commentary on the Book of Job;" "A Concordance to the Bible;" "The Student's Dream;" and "A common-place Book of the Life of Preachers."—Conrad of Alli, a Pietemonde Dominican monk, was author of "Commentaria in Jos Canonicum," and other pieces. He died in the year 1470.—In the sixteenth century appeared Conrad Lontinus, a learned German Cistercian monk, who appears to have been well acquainted with the best writers in profane and sacred literature, and to have maintained an intimate correspondence with the most learned men of his time. He published, in the year 1587, at Boul, "Nicholas de Lyra's Commentary on the Bible, with marginal Notes."—There were several others of this name, but it is needless to mention them all. Conrad of Mur, son of the church of Zurich, lived in the thirteenth century, and is known for his treatise on the sacraments, and the lives of the popes: and Conrad of Saxony wrote "A Chronicle," and some historical works, to which no date is assigned. Moreri. CONRI, Florence, a Franciscan friar, was born in the province of Connaught, about the year 1560, and was sent at an early age into Spain, as a student in theology and the philosophy of the times. When he had finished his studies, he travelled into the Low Countries, where he acquired great reputation among the Catholics, by his industry and zeal in illustrating and defending the doctrines of St. Augustine. He was author of several tracts on theological subjects, among which were "The Mirror of the Christian Life," "A Mem. of Catechism," printed at Louvain, in 1625; and "Treatises de Sacra of General "Baptism deedest ex hac Vita," Lovani, 1624. As a politician, he was fixed on to conciliate his countrymen to the measures of the court of Spain, when Philip III. attempted the conquest of Ireland, during the reign of Elizabeth. On the failure of that enterprise he escaped from
the country, and spent the remainder of his life in the Low Countries, and at Madrid, supported by a pension from Spain, in recompense for the services which he intended, but which proved ineffectual. He died at Madrid, in the year 1630. Moreri.

**CONRINGIUS, Herman, a philogopher of great talents, and almost universal learning, born at Norder in East Friesland in November, 1666, received his education at Heimhadt, where he was made doctor in medicine in 1636, and soon after advanced to the chair of professor in that science. He was also, in succession, appointed professor in physics, law, and politics. For his profound knowledge in the laws of nations and politics, he was consulted, and made physician and aile counsellor to Carliina, queen of Sweden, to the king of Denmark, and to several of the German princes and electors. Of his capacity for these employments abundant proof may be found in his numerous works in philosophy, medicine, and history, which were long held in great repute, though now referred rather from curiosity than for their utility. In all of them, however, there is a wonderful display of learning. In his philosophy he was a follower of the school of Aristotle, as he proclaims in the first of his publications, viz., "De Calido inato, de Morte, et Vita, et de Origine Formarum, libri, omnia ad Aristotelis Sententias elaborata." Lug. Bat. 1631, 8vo., republished with additions in 1640, 43, and 46; "De Germanicorum Corporum Habitibus antiqui et novi Canis, Differtatio," Helm. 1645, 4to. This has been frequently reprinted. The author has some ingenious conjectures on the canons of the diminished stature, and altered complexion, and habit of body, of the Germans, which he draws from indisputable documents which have taken place among these people. The ancient Germans were fair, with blue eyes, and abundant yellow hair, "Robulitis nato parentibus, sero venere deudente, inque conjugio caelos vicissuius, et fess vires conservasse integritates, et pinnorum filius impressibile, &c. &c. An entire change in the mode of living, the use of fows, of tobacco, &c., he conceives to have gradually undermined their constitutions, and to have produced the changes he states to have taken place. An edition of this work was printed at Frankfort, with notes, by Philip Burghaw, 8vo. 1727. "De Hermetica Aegyptiorum vetere, et Paracellica nova Medicina," Helm. 1648, 4to.; reprinted, with additions, 1669: a work abounding with ingenious and learned speculations, but little now attended to. "Introductio in universam Artem Medicam, ejusque singulas Partes," 1654; re-edited by Schelhammer, 1687; and again by Hoffman, 1726, 4to.; containing an history and bib. medica, with observations on the principal facts and writers in medicine, besides numerous disquisitions on particular diseases, as dropsy, pleurisy, &c. Conringius is said to have been remarkably diminutive in stature, but of great vivacity, and enjoying a strong memory. He retained the situation of fenis of the university of Heimhadt to the time of his death, which happened on the 12th of December, 1681. His character is contained in the following epitaph:

Hoc tumulo
Clauditur regum principumque consiliorum,
Juris naturales gentium publici doctor,
Philosophiæ omnium pedilium, præstite et theoretæ,
Philologus insignis, orator, poeta, historian, medicus,
Theologus.
Multas putas tuis conditionis.
Unus eft Hermanus Conringius, facculus miraculum,
Pohlit Henricus Medibomius.
Haller Bib. Eloy Dict. Hlst.
Vol. IX.
only to find a power of \(2\), the index of which is the number of degrees; \(\text{e.g.} \ 2^1, 2^{10}, 2^{14}, \text{etc.}\) will give the corresponding number respectively. Or, the number of ancestors at any even degree may be had by squaring the number of ancestors at half that number of degrees: thus \(16\), the number of ancestors at 4 degrees, is the square of \(4\), the number of ancestors at 2; \(256\) is the square of \(16\); \(65536\) of \(256\); and the number of ancestors at 40 degrees would be the square of \(1048576\), or upwards of a million of millions. These powers are easily found by means of logarithms. See Progression.

**Table II.**

<table>
<thead>
<tr>
<th>Collateral Degrees</th>
<th>Number of Kindred.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>4</td>
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<tr>
<td>3</td>
<td>16</td>
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<tr>
<td>4</td>
<td>64</td>
</tr>
<tr>
<td>5</td>
<td>256</td>
</tr>
<tr>
<td>6</td>
<td>1024</td>
</tr>
<tr>
<td>7</td>
<td>4096</td>
</tr>
<tr>
<td>8</td>
<td>16384</td>
</tr>
<tr>
<td>9</td>
<td>65536</td>
</tr>
<tr>
<td>10</td>
<td>262144</td>
</tr>
<tr>
<td>11</td>
<td>1048576</td>
</tr>
<tr>
<td>12</td>
<td>4194304</td>
</tr>
<tr>
<td>13</td>
<td>16777216</td>
</tr>
<tr>
<td>14</td>
<td>67108864</td>
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<tr>
<td>15</td>
<td>268435456</td>
</tr>
<tr>
<td>16</td>
<td>1073741824</td>
</tr>
<tr>
<td>17</td>
<td>4294967296</td>
</tr>
<tr>
<td>18</td>
<td>17179869184</td>
</tr>
<tr>
<td>19</td>
<td>68719476736</td>
</tr>
<tr>
<td>20</td>
<td>274877906944</td>
</tr>
</tbody>
</table>

It is obvious that in this table the numbers in the progression increase much more rapidly than those of the former table; for though the first born is 1, the ratio of the progression is 4; that is, there is one kindred (a brother) in the first degree, who makes, together with A. B., the progenitor, as he is called, the two descendants from the first couple of ancestors; and in every other degree, the number of kindred must be quadruple of those in the degree which immediately precedes it. For, since each couple of ancestors has two descendants, who increase in a duplicate ratio, it will follow that the ratio in which all the descendants increase downwards must be double that in which the ancestors increase upwards; but the ancestors increase upwards in a duplicate ratio; therefore the descendants must increase downwards in a double duplicate; that is, in a quadruple ratio. This calculation may be formed by a more compendious process, viz. by squaring the number, or half the number of ancestors at any given degree, which will furnish the number of kindred who have in the same degree, at equal distance with ourselves from the common flock, besides those at unequal distances. Thus, in the 10th lineal degree, the number of ancestors is 1024; its half, or the couples, amount to 512; the number of kindred in the 10th collateral degree amounts, therefore, to 262144, or the square of 512. Or, it will be seen in the table that \(4^3 = 64\), the number of kindred in the 4th collateral degree; \(4^7 = 256\), the number in the 5th degree; \(4^{10} = 1024\), the number in the 6th degree, &c. and therefore if the number of degrees be denoted by \(n\), \(4^{n-1}\), will be the number of kindred in the degree expressed by \(n\); which is easily obtainable by the aid of logarithms in any degree, however remote. If any one will be at the trouble of recollecting the fate of the several families within his own knowledge, and of observing how far they agree with this account; that is, whether, on an average, every man has not one brother or sister, four first cousins, sixteen second cousins, and so on; he will find that the present calculation is very far from being overcharged.

From the records of scripture we learn, that there is one couple of ancestors belonging in common to us all, from whence the whole race of mankind is descended; and hence we deduce, as an obvious and undeniable consequence, that all men are in some degree, however remote, related to each other. For, indeed, if we only suppose each couple of our ancestors to have left one with another, two children; and each of those children on an average to have left two more; (and, without such a supposition, the human species must be daily diminishing) we shall find that all of us have now subliling nearly \(270\) millions of kindred in the 15th degree, at the same distance from the several common ancestors as we ourselves are; besides those that are one or two degrees nearer to or father from the common flock, who may amount to as many more. And, if this calculation should appear incompatible with the number of inhabitants on the earth, it is because, by intermarriages among the several descendants from the same ancestor, a hundred or a thousand modes of confusion may be consolidated in one person, or he may be related to us a hundred or a thousand different ways.

The method of computing these degrees in the canon law (Decretal. 4. 14. 3 & c.) which our law has adopted (Co. Litt. 23.) is as follows: We begin at the common ancestor, and reckon downwards; and in whatsoever degree the two persons, or the most remote of them, is distant from the common ancestor, that is the degree in which they are related to each other. Thus, Titius and his brother are related in the first degree; for, from the father to each of them is counted only one; Titius and his nephew are related in the second degree; for the nephew is two degrees removed from the common ancestor, viz. his own grandfather, the father of Titius. See Blackiz. Comm. ii. 261.

Marriage is prohibited by the church to the fourth degree of consanguinity inclusive; but, by the law of nature, consanguinity is no obstacle to marriage, except it be in the direct line. See Marriage.

Consanguinity terminates in the fifth and seventh degree, excepting in the succession to the crown; in which case, consanguinity is continued to infinity.

The civilians call frater consanguinis, those born of the same father; in opposition to frater utebris, who are only born of the same mother. See Descent.

According to the common opinion, those were not allowed to complain of an infidels meum testament, i.e. of being disinhérited without cause; excepting from the turpitude of the person appointed heir in their place. But Van Water endeavours to shew the contrary; and urges, that the consanguinis might plead insufficiency, even where the testament was not made in favour of a person incapable. See Kindred.

Consar, in Geography, a town of Persia, in the province of Irak; 52 miles N.W. of Ipahan.

Consarbruck, or Conz, a town of Germany, in the electorate of Treves, situated at the conflux of the Saar and the Moselle; 2 miles S. of Treves.

Consbach, a town of Sweden, in South Gothland; 32 miles N. of Wardberg.

Conscience, in Ethics, a secret testimony or judgment of the soul, or as some have defined it, a distinct faculty or power of the mind, by which it gives its approbation.
tion to things it does that are naturally good; and reproaches itself for those that are evil. Or, conscience is a dictate of the understanding power, concerning moral actions; considered as it has the knowledge of laws; and consequently as concerns of what is to be done, or not done, with regard to the legislator.

In the more popular sense of the word, conscience is a judgment, either true or false, whereby we pronounce a thing good or evil. This makes what we call the inner forum, or tribunal. Accordingly, it should be considered, not as a mere intellectual light, or informing faculty, a dictate of the practical understanding (as the schools call it), which directs, admonishes, and influences us, in what we are to do; but as it acts upon the soul by a reflection on what we have done; and is, by that means, the source and cause of all that joy, or dejection of mind, of those internal sensations of pleasure or pain, which attend the practice of great virtues or great vices.

Some divines maintain, that conscience is infallible; and hold it to be that immutable law whereby God will judge men: they deny that the understanding can be the source of errors, and lay them all at the door of the will. A man, say they, may secure himself from error, by forbearing to judge of things till he have a clear and distinct perception of them.

Some of the schoolmen distinguish between the conscience antecedent to an action, and that consequent to it: the first, called antecedent conscience, determines what is good, and what evil; and consequently prescribes what is to be done, and what avoided. Consequent conscience is a kind of secondary or reflex judgment, with regard to the goodnes, &c. of things, already done or committed.

The rule of conscience is the will of God, so far as it is made known to us, either by the light of nature, or by that of revelation. With respect to the knowledge of this rule, conscience is said to be rightly informed, or mistaken; firm, or wavering, or scrupulous, &c. With respect to the conformity of our actions to this rule when known, conscience is said to be good, or evil, &c.

In a moral view, it is of the greatest importance that the understanding be well informed, in order to render the judgment or verdict of conscience a safe directory of conduct, and a proper source of satisfaction. Otherwise, the judgment of conscience may be pleaded, and it has actually been pleaded, as an apology for very unwarrantable conduct. Many atrocious acts of perfecution have been perpetrated, and afterwards justified, under the sanction of an erroneous conscience. It is also of so small importance, that the facility of conscience be duly maintained and cherished; for want of which men have often been betrayed into criminal conduct without self-reproach, and have deluded themselves with false notions of their character and state.

Dr. Reid (See his “Essays on the active Powers of Man,” p. 252, &c.) has made the following observations on that power of the mind, which we call conscience. 1. Like all our other powers, it comes to maturity by infants degrees, and may be much aided in its strength and vigour by proper culture. 2. Conscience is peculiar to man. We see no velleity of it in brute animals; and it is therefore one of those prerogatives by which we are raised above them. Conscience is evidently intended by nature to be the immediate guide and director of our conduct, after we arrive at the years of understanding. Other principles may urge and impel; but this only authorizes. Other principles ought to be controlled by this: this may be, but never ought to be controlled by any other, and never can be with innocence. From these observations it evidently follows, that the moral faculty of conscience is both an active and an intellectual power of the mind. As an active principle, it sometimes concurs with other active principles, sometimes opposes them, and sometimes is the sole principle of action. As an intellectual principle, we have by it, and by it alone, the perceptions of right and wrong in human conduct, in their different degrees and different species. Philosophers in lieu of the word conscience, which seems appropriated to theological matters, frequently use that of consciousness; which see.

The power of conscience has been remarked in all ages of the world, and under all dispensations of religion; and history, both sacred and profane, furnishes innumerable examples, that are eminently instructive. One remarkable instance of this kind occurs in the history of Joseph and his brethren (see Gen. chap. xlili. and particularly v. 21.) Another is presented to us in the account which the evangelist Matthew has given us of the feelings and reflections of Herod the tyrant, when he heard of the name of Jesus, after he had occasioned the death of John the Baptist. (See Matt. xiv. 1, 2, 3.) Bishop Atterbury has admirably portrayed the state of Herod’s mind, in his excellent sermon on this subject. (Sermons, vol. iv. Serm. 4.) Many instances of a similar kind occur in profane history. We shall content ourselves with selecting one, and shall give it in the words of the elegant preacher already cited. “Tiberius, that complete pattern of wickedness and tyranny, had taken as much pains to conquer these fears (referring to the fears of futurity before deferred) as any man, and had as many helps and advantages towards it, from great splendour and power, and a perpetual succession of new buffoons, and new pleasures: and yet, as great a matter of dissatisfaction as he was, he could not dissemble the inward sense of his guilt, nor prevent the open eruptions of it upon very improper occasions. Witnesses that letter which he wrote to the senate from his impure retreat at Capræa. Tacitus has preserved the first lines of it; and there cannot be a livelier image of a mind filled with distraction and despair than they afford us: Quod, feribam volui, P. C. aut quomodo feribam, ut quid non moveo non feribam hoc tempore, Dei me Dercque pugis perdant, quam petere quisque fatis, si fatis! that is, ‘What, or how, at this time, I shall write to you, fathers of the senate, or what indeed I shall not write to you, may all the powers of heaven confound me yet worse than they have already done, if I know or can imagine!’ And his observation upon it is well worthy of ours, and very apposite to our present purpose: ‘In this manner (says he) was this emperor punished by a reflection on his own infamous life and guilt; nor was it in vain that the greatest matter of wifdom (he means Plato) affirmed, that were the hearts of tyrants once laid open to our view, we should see there nothing but ghastly wounds and bruises; the consciousness of their own cruelty, lewdness, and ill conduct, leaving as deep and bloody prints on their minds, as the strokes of the scourge do on the back of a slave. Tiberius (adds he) confessed as much, when he uttered these words; nor could his high station, or even privacy and retirement itself, hinder him from discovering to all the world the inward agoniés and torments under which he laboured.” Thus that excellent historian. We cannot forbear subjoining the following fact, related by Mr. Fordyce in his “Dialogues on Education” (vol. ii. p. 401), as a real occurrence which happened in a neighbouring state not many years ago. A jeweller, a man of good character and considerable wealth, leaving occasion, in the way of his business, to travel at some distance from the place of his abode, took along with him a servant, in order to take care of his portmanteau. He had with him some of the
bully jewels, and a large sum of money, to which his servant
was likewise privy. When the master had occasion to dis-
mount on the road, the servant, watching his opportunity,
took a pistol from his master's saddle and shot him dead on
the spot; he then rifed of his jewels and money, and
hanging a large stone to his neck, throw him into the nearest
canal. With this booty he made off to a distant part of the
country, where he had reafon to believe that neither he nor
his master were known. There he began to trade in a low
way at first, that his obfcurity might screen him from ob-
ervation, and in the course of feveral years seemed to rise,
by the natural progress of bufinefs, into wealth and con-
fraction; fo that his good fortune appeared at once the ef-
eft and reward of industry and virtue. Of this he con-
fronted the appearance fo well, that he grew into great credit,
mixed into a good family, and by laying out his hidden
fortunes as fcarcely as he could, and joining to all an
unfeveral affinity, he was admitted to a share in the govern-
ment of the town, and role from one poll to another, till at
length he was chosen chief magistrate. In this office he
maintained a fair character, and continued to fill it with no
small applause, both as a governor and a judge; till one day
as he sat on the bench with some of his brethren, a criminal
was brought before him who was accus'd of murdering his
master. The evidence came out full, the jury brought in
their verdict that the prisoner was guilty, and the whole as-
sembly waited the fentence of the prefident of the court (an
office which that day belonged to him), with great fufpence.
In the mean while he manifested an unfulfill disorder and agi-
tation of mind, and his colour often changed; at length he
arofe from his seat, and coming down from the bench, placed
himfelf juft by the unfortunate man at the bar. "You
fee before you (faid he, addressing himfelf to thofe who had
fat on the bench with him) a ftriking infufion of the juft
ration of heaven, which this day, after 30 years' conceal-
ment, presents to you a greeter criminal than the man juft
now found guilty." He then proceeded to make an ample
confifion of his guilt, and of all its aggravations. "Nor
am I felt (continued he) any relief from the agonies of an
awakened confcioufnefs, but by requiring that juftice be forth-
with done againft me in the moft public and solemn man-
ner." We may juftly fuppofe the amazement of the whole
assembly, and especially of his fellow-judges. However,
they proceeded, upon this confifion, to pass fentence upon
him, and he died with all the symptoms of a peafant
mind.

CONSCIENCE, Court of. See COURT.

CONSCIOUSNESS, in Logic and Metaphysics, is the
mind's perception of its own existence, facilities, and op-
erations; and, in this view of it, it is one of the fources of
judgment, and one species of evidence. Confeiionefls,
faith Dr. Reid, (Essays on the Intellectual Powers of Man,
p. 578.) is an operation of the understanding of its own
kind, and cannot be logically defined. The objects of it
are our prefent pains, our pleafures, our hopes, our fears,
our defires, our doubts, our thoughts of every kind in a
word, all the passions, and all the actions and operations of
our own minds, while they are prefent. We may remem-
ber them when they are past: we are confcioufs of them only
while they are prefent. It is, therefore, a firft princi-
ple that every thing exits of which we are confcioufs.
When a man is confcioufs of pain, he is certain of its exis-
tence; when he is confcioufs that he doubts, or believes, he
is certain of the effifence of fuch operations. And his
confcioufnes of the reality of fuch operations is not the ef-
eft of reafoning; it is immediate and intuitive. The effifence,
therefore, of the passions and operations of our minds, of
which we are confcioufs, is a firft principle, which reftores
requires us to believe upon her authority. Indeed, this is
the only principle of common fense, which has never been
directly called in quefion, and which retains its authority
with the greatest facility. Mr. Hume, after annihilating
body and mind, time and space, action and caufation,
and even his own mind, acknowledges the reality of the
thoughts, fentiments, and passions of which he is confcioufs.
From this fource of confcioufnes we derive all that we
know, and indeed all that we can know, of the ftructure,
and of the powers of our own minds: from which we may
conclude, that no branch of knowledge stands upon a ftronger
foundation; for surely no kind of evidence can go beyond
that of confcioufnes. Some have confounded confcioufnes
and reflection, though they are essentially diftinft. The
former is common to men at all times, but is insufficient
as to give us clear and diftinft notions of the operations of which
we are confcioufs, and of their mutual relations, and minute
differencies. The second, or attentive reflection upon
these operations, making them objeds of thought, for-
veying them attentively, and examining them on all fides, is
far from being common to all men, that it pertains to
very few.

Another firft principle, in relation to the fubject of this
article is, that the thoughts of which any one is confcioufs
are the thoughts of a being which he calls himfelf, his mind,
his perfon. "If any man asks a proof of this," fays Dr.
Reid, "I confefs I can give none; there is an evidence in
the propofition itfelf, which I am unable to refute. Shall I
think, that thought can ftand by itfelf without a thinking
being? or that ideas can feel pleafure or pain? My nature
dictates to me that it is impoffible. And that nature has
dictated the fame to all men, appears from the ftructure of
all languages; for in all languages men have expreffed
their ideas, by thinking, reafoning, feeling, loving, hating,
by personal verbs, which from their nature require a perfon who
thinks, feels, loves, hates. From which it appears,
that men have been taught by nature to believe that thought
requires a thinker, and reafon a reasoner, and love a lover."[
"Here," continues Dr. Reid, "we mtift leave Mr.
Hume, who conceives it to be a vulgar error, that besides
the thoughts we are confcioufs of, there is a mind which is
the fubject of thofe thoughts." If the mind be any thing
of more importance than impressions and ideas, it must be a word without
a meaning. The mind, therefore, according to this philo-
fer, is a word which signifies a bundle of perceptions; or
when he defines it more accurately, that it is the fufcifi-
fion of related ideas and impressions, of which we have an intimate
memory and confcioufnes. Whence it follows that, "I am,
faith our author, "that fucfiffion of related ideas and
impressions, of which I have the intimate memory and confci-
oufnes. But who is the I that has this memory and
confcioufnes of a fucfiffion of ideas and impressions? Why, it
is nothing but that fucfiffion itfelf."-Identity of confcioufnes, according to Mr. Locke,
constitutes identity of perfon. For a further difcufion of this
fubject, see IDENTITY.

CONSCRIPT, CONSCRIPTUS, a popular term in the
Roman history, used in speaking of feators, who were
called conscripts, fathers, patres conscripti; because their
names were written in the regifter, or catalogue of the
feators.

Livy, lib. i. cap. 1. tells us, that when Brutus filled
up the places of the feators cut off by Tarquin, with
others chosen out of the equeftrian order, those new
feators only had the appellation given them of patres
conscripti.

CONSCRIPTS
CONSCRIPTS also denote men raised to recruit the Imperial and French armies. All men capable of bearing arms in Hungary and Bohemia, have been usually enregistered and obliged to march wherever their services were called for. The conscripts in France, during the last and present war, have been raised on similar principles.

The militia of Great Britain comes likewise in some measure under this denomination or description, with this difference, that the men have been raised by ballot, and do not leave their native country, unless they voluntarily offer their services for that purpose.

Consecration, the act of converting or setting apart, any profane, or common thing, to a pious purpose; with certain ceremonies, prayers, benedictions, &c. appropriate to it.

Consecration is the return of sacrifice and profanation, which conflict in perverting a thing set apart for a pious purpose, to a profane and popular one.

The bishop consecrates a church, or a chalice; the pope consecrates medals, agnus dei's, &c. and grants indulgences to those who bear such about them with devotion. The consecration, or dedication, of a church is an episcopal ceremony, consisting in a great number of benedictions, with aspirations and invocations of chrism, &c. on the walls, both within and without. The form for consecrating churches, chapels, and church-yards, or places of burial, in England, may be seen in Wilkins's Concilia Magnae Britanniae, &c. vol. iv. p. 659. It directs that the bishop and clergy, of whom there are to be at least two, shall enter the church or chapel in their several habits, and, as they walk up from the well to the east end, repeat alternately the 24th Psalm; the bishop beginning, "The earth is the Lord's," &c. with the "Gloria patri." When they are come to the Lord's table, the bishop sitting in his chair shall have the instrument of dedication, donation, and endowment of the church or chapel, church-yard, or burial-place, presented to him by the founder, or some proper person, which he shall cause to be read by his registral, or other officer; and then the instrument shall be laid on the table, and he shall stand on the north side of it, and turning to the congregation, deliver an address to them, which is followed by suitable prayers. One of the priests then reads the service of the day, introducing proper psalms and litanies; after which, the bishop proceeds to the communion service, and instead of the collect of the day, utes one proper to the occasion. When the Epistle and Gospel are read, they are succeeded by the Nicene creed and the sermon; and then the bishop is to proceed with the service of the communion. When the service in the church is finished, the bishop and clergy with the people shall go into the church-yard, and make use of a prayer for the occasion. See uti jacta.

The custom of consecrating persons, temples, altars, vestments, utensils, &c. is very ancient; and all the ceremonies thereof are prescribed under the old law. When those consecrations relate to men, they are properly called ordinations; excepting those performed to bishops and kings, which full retain the name of consecration. Those which only consist in a ceremony instituted by the church, are more properly called benedictions. When they regard churches, altars, vessels, &c. they are properly called dedications.

In the trial of archbishop Laud, A.D. 1644, it was one of the charges alleged against him by the commons, that he had traitorously endeavoured and practised "to alter and subvert God's true religion by law established in this realm, and wished them to set up popish superstition and idolatry, and to reconcile us to the church of Rome." One branch of this charge was his introducing and practising certain popish innovations, and superstitious ceremonies, not warranted by law, nor agreeable to the practice of the church of England since the reformation. In proof of this charge, the managers, on the part of the commons, charged on his countenancing the setting up of images in churches, church-windows, and other places of religious worship. See Image.

Another popish innovation charged on the archbishop was, his superstitious manner of consecrating chapels, churches, and church-yards, such as had been practiced in Creed-church, and in the church of St. Giles's in the Fields. The managers objected further, his consecrating altars with all their furniture, as patterns, chalices, altar-cloths, &c. even to the knife that was used for cutting the sacramental bread; and his dedicating the churches to certain saints, together with his promoting annual revels, or feasts of dedication, on the Lord's day, in several parts of the country, by which that holy day was profaned, and the people encouraged in superstition and ignorance. With respect to the consecration of churches, the archbishop replied, that the practice was as ancient as Moses, who consecrated the tabernacle, with all its vessels and ornaments; that the temple was afterwards consecrated by Solomon; that as soon as Christian churches began to be built, in the reign of Constantine the Great, they were consecrated, as Eusebius testifies concerning the church of Tyre, (E.H. l.x. c. 3.), and so it has continued to the present time. Besides, if churches were not consecrated, they would not be holy, &c. &c. As to the manner of consecrating Creed-church, St. Giles's, &c. his grace confided that, when he came to the church-door, that passage in the Psalms was read, "Lift up your heads, O ye gates, even lift them up, ye everlasting doors, that the king of glory may come in;" that he knelled and bowed at his entrance into the church, as Moses and Aaron did at the door of the tabernacle; that he declared the place holy, and made use of a prayer like one in the Roman pontifical; that afterwards he pronounced divers curfes on such as should profane it, but denied his throwing dust into the air, in which he said, the witnesses had forsworn themselves; for the Roman pontifical does not prescribe throwing dust into the air, but ashes; and he conceived there was no harm, much less treason in it. As the consecrating of churches, and also dedicating them to God, has been of ancient usage, so has the consecration of altars and their furniture; and such consecrations are necessary, for else the Lord's table could not be called holy, nor the vessels belonging to it, as they usually are; yea, there is an holiness in the altar, which distinguishes the gift, which it could not do, unless itself was holy; if there be no dedication of these things to God, no separation of them from common use, then there can be no such thing as sacrifice, or difference between our holy table and a common one. And as to the form of consecrating the said things, the archbishop alleged, that he had it not from the Roman pontifical, but from bishop Andrews.

The managers for the commons replied, that if the temple was consecrated, it was by the king himself, and not by the high-priest; and if the tabernacle was consecrated, it was by Moses, the civil magistrate, and not by Aaron the high-priest; but we read, they said, of no other consecrating the tabernacle and its utensils, but anointing them with oil, for which Moses had an express command; nor of any other consecrating the temple, but of Solomon's making an excellent prayer in the outward court, not in the temple itself, and of his hallowing the middle court by offerings and peace-offerings; and it is observable, that the cloud and glory
CONSECRATION.

glory of the Lord filled the temple, so that the priests could not stand to minster before Solomon made his prayer, which some call his consecration. But if it should be allowed, that the temple was consecrated in an extraordinary manner, we have no mention either in Scripture, or in Jewish writers, of the consecration of their synagogues, to which our churches properly succeed. And, after all, it is no conclusive way of arguing, to derive a Christian institution from the practice of the Jewish church, because many of their ordinances were temporary, and abolished by the coming of Christ. Moreover, it is said, that from the beginning of Christianity, we have no credible authority for consecrating churches for 300 years. Eusebius, in his life of Constanine the Great, does indeed mention his consecrating a temple which he built over our Saviour's sepulchre at Jerusalem; but how?—with prayers, disputations, preaching, and exposition of scripture, as he expressly defines it (cap. 45.) Here were no proeessions, no knocking at the doors by the bishop, crying, "Open ye everlasting doors!" no calling duff or ashes into the air, and pronouncing the ground holy; no reverencing towards the altar, nor a great many other inventions of later ages. There were not known in the Christian church, till the very darkest times of popery; nay, in those very dark times, we are told by Otthe, the pope's legate, in his Ecclesiastical Conclusions, that in the reign of King Henry III., there were not only divers parish churches, but some cathedrals in England, which had been used for many years, and yet never consecrated by a bishop. But the archbishop's method of consecrating churches, it is said, evidently appears to be a modern popish invention; for it is agreed by Gratian, Pataia, the Centurinators, and others, that the popes Hyginus, Gelasius, Silvester, Felix and Gregory, were the first inventors and promoters of it; and it is nowhere to be found but in the Roman pontifical, published by command of pope Clement VIII. (De Ecclesiis dedicatione, p. 209, 286,) for which reason it was exploded and condemned by our first reformers, and particularly by bishop Pilkington, in his comment upon Haggai (ch. i. ver. 71, 81.) and archbishop Parker, who (in his Antiq. Brit. p. 87, 87,) expressly condemns the archbishop's method of consecration, as popish and superstitious. (See Altar.)

The archbishop, however, says, that if churches were not consecrated, they cannot be holy; whereas many places that were never consecrated are looked holy, as the most holy place, and the holy city Jerusalem; and our orthodox say, that the church is called holy, not of itself, but because God's people retaining thither come holy, and exercise themselves in holy things; and it is evident that sanctification, when applied to places, is nothing else but a separation of them from common use to a religious and sacred purpose, which may be done without the superstitious method above-mentioned; and though the archbishop avers, that he had not his form of consecration from the Roman pontifical, he acknowledges that he had it from bishop Andrews, who could have had it nowhere else.

As for the consecration of altars, pattens, chalices, altar-cloths, and other altar-furniture, its original is no higher than the Roman missal and pontifical, in both which there are particular chapters and set forms of prayer for this purpose; but to imagine that these vessels may not be reputed holy, though separated to an holy use, unless they are thus consecrated, is defective of foundation in reason or scripture, and contrary to the practice of the church of England, and the opinion of our first reformers. As to the practice of dedication, see Dedication. Neal's Hist. of the Puritans, vol. ii. ch. 5. 40.

CONSECRATION of the Pope, a ceremony which is particularly described by cardinal Raphson, in his book concerning the church of the Lateran, and which is also related by another Benedictine in his metallic history of that city; and by Lenfant, in his history of the council of Constance. "Before the usage of the concave was introduced by Gregory the tenth," says cardinal Raphson, "the cardinals, three days after the obsequies of the former pope, convened in the Lateran church, where, after the invocation of the Holy Spirit, and the celebration of mass, they proceed to the election of a pope. The election being made, the first cardinal deacon invected the pope elect in his pontifical habit, and announced the name which he chose to take;" for it has been the custom now, for several centuries, that the pope should assume a new name on being elected. "Afterwards, two cardinals, the most eminent in dignity, one on his right hand, the other on his left, conducted him to the altar, where he prostrated himself in adoration of God, whilst they sang the Te Deum. After the Te Deum, the cardinals seated the pope in a marble chair, which was behind the altar, under a fort of dome, or vault, where the pope, being set, admitted the cardinals, the bishops, and some others, to kiss his feet, and to receive the laves of peace. Then the pope rising, the cardinals conducted him through the portico to another chair, bordered like what is called in French, les portes. This chair was thence very properly named saceroraria, the saceroraria. It was formerly placed before the portico of the patriarchal basilica, and is now to be seen in the cloister of that basilica." The use of these chairs, however, was afterwards abolished by Leo the tenth, probably for this, amongst other reasons, because the perjured chair was become connected with the fabulous story of the female pope. That, however, is not a protestant fable, as some perfons ignorantly pretend, for it was current long before the days of Luther. But the continuance of the use of that chair preferred the memory of the story, and might appear to the credulous an evidence of its truth. Whilst the pope sat on the saceroraria, the choir sang these words of scripture: Sufciat de pulvere egenum, et de fercore erigit pauperem, ut fedest eum principibus, et folium gloriosum teneat. Psalm, exii. 7. The last clause is not in the psalm. He raiseth the poor out of the dust, and lifteth the needy off the dunghill, that he may set him with the princes of his people, and that he may poffess the throne of glory. The intention of this ceremony, it was said, was to iniminate to the pope the need there is of the virtue of humility, which ought to be the first step of his greatness. After remaining some time in this chair, the pope recumbeth himself in the hands of the chamberlain three dentors, which he throweth to the people, pronouncing these words: Silver and gold I have none for my pleasure, but what I have I give you. Afterwards, the prior of the Lateran basilica, and one of the cardinals, or one of the canons of that basilica, took the pope between them, and whilft they walked in the portico, fioots of esclamation were raised near the basilica, and the election was declared, with the name which the pope had taken. In this manner they conducted the pope to the basilica of St. Sylvester, where, being placed before this basilica in a chair of porphyry, the prior of the basilica put into his hands a ferula, in sign of correction and government, and the keys, to denote the power which God gave to St. Peter, prince of the apostles, of opening and shutting, of binding and loosing, and which paffes (according to our historian) efficaciously to all the Roman pontiffs. Thence the pope, carrying the ferula, and the keys, went to place himself in another chair, resembling the former; and after remaining there some time, refofed the ferula and the keys to the prior, who girt him with a girdle of red silk, giving him a move.
Consecration.

The word *consecration* is used in the liturgical and ecclesiastical context to denote the act of setting apart or dedicating something, usually for a religious purpose. This can involve the setting apart of a place, person, or object for a sacred purpose, often as part of a liturgical ceremony. In the context of the Church, consecration is an important act that sets apart a person or thing for God's use.

The text provided is a historical description of a consecration ceremony that took place in St. Peter's Basilica, Rome. The ceremony involved a number of symbolic actions, such as the anointing of the pope, the presentation of gifts, and the procession of the cardinals and clergy. The ceremony was performed as a way to sanctify the pope and the church, setting them apart for the holy work of ministry.

The ceremony was also performed as a way to celebrate the pope's ordination to the apostolic office, and to bless the pope and the church with the gifts of the Holy Spirit. The ceremony was a public display of the pope's holy office, and a way to celebrate the spiritual work of the church.

The text provides a detailed account of the ceremony, including the various actions performed, the symbolic significance of each action, and the historical context of the ceremony. The ceremony was performed as a way to sanctify the pope and the church, and to bless the people with the gifts of the Holy Spirit.
my body; this is my blood; which the Greeks maintain are
only necessary in the proofs of the consecration, as they
contam the history of the institution; not as they contribute
any thing to the change.

Consecration of various animals, was common among
the ancient Greeks and Romans. Suetonius mentions the
consecration of a great number of horses by Julius Cæsar,
when he passed the Rubicon; and Eustathius observes, that
it was common among the Greeks to consecrate whole-herds
of cattle, and several flocks of birds, especially geese and
peacocks, to their gods; giving such animals their liberty,
and forbidding all persons to touch or molest them. Atha
neus remarks, that they paid the same respect to fishes, par-
ticularly those bent adapted to the palate; and Pliny takes
notice, that the dolphin of Octavius Augustus had this fa-
vour conferred upon him. Aelian likewise relates, that they
sometimes put necklaces about the necks of thier fishes, and
then turned them loose to their proper element. The Ro-
mans also had their magical consecrations: it being cu-
tomary for their emperors to offer sacrifices, repeat charms,
dispel statues in certain places, imagining that such magi-
cal operations would hinder barbarians from entering their
domestions. Thus Marcus Antonius endeavoured to for-
ify himself against the invasion of the Marcomanni; and
some have thought that the palladium of Troy, and the
volcanic statue of Mammern, were of this kind. Macrobius
has given us a particular description of the consecration of
the Roman pontiffs, to the following purport: they dug a
pit in the earth, into which the perfon to be consecrated was
let down, dressed in priestly vestments, and the pit was
covered with a plank bored almost full of holes; a bull,
crowned with garlands of flowers, was placed on this plank,
and his throat being cut, the blood poured through the
plank on the priest, who received it on his head and face.
On ascending from the pit, covered with blood, he received
the salutation of Pontifex.

Consecration, among Magians, is the ceremony of the
apostasia of an emperor; or his translation into heaven,
and reception among the gods. See Apothesis.

On medals, the consecration is thus represented: on one
side is the emperor's head, crowned with laurel, sometimes
veiled; and the inscription gives him the title of divus: on
the reverse is a temple, a bull, an altar, or an eagle tak-
ing its flight towards heaven, either from off the altar, or
from a cippus; at other times the emperor is seen in the air,
borne up by the eagle; the inscription alway, conse-
crate.

These are the usual symbols: yet on the reverse of that
of Antoninus, is the Antonine column. In the apotheosis
of emperors, instead of an eagle there is a peacock. As to
the honours rendered these princes after death, they were
explained by the words consecratio, pater, divus, and deus.
Sometimes around the temple or altar are put, memoria felix,
or memoria eterna; for princesses, eternitas, and fidelitas
recepta; on the side of the head, deus, or Om. See Medal.

Consectary, a proposition that follows, or is de-
duced, from some preceding definition, lemmata, axioms,
conclusions, or the like. Some rather choose to call it a
consequence: and others a corollary, &c.

Consecutive Chords, in Music, are such as im-
meditately succeed each other in composition or performance.
See Music, Plate IV. Holder truly observes, when
speaking of the rule in composition, which follows a suc-
cession of octaves or fifths, except by contrary motion, that
in triads the name applies to all consecutively intervals what-
ever; but that the intermixture of major and minor thirds,
and major and minor-sixths in the scale, renders the oc-
urrence of consecutive major-thirds, major-sixths, minor-
thirds or minor-sixths, very rare and inoffensive in their cli-
ing effect upon the ear, compared with those of fourths,
fifths, or octaves, if care is not taken by the composer to
prevent the succession of the latter, except in contrary
motions.

Consecutively, consecutively, in the School Phi-
losophy, is sometimes used in opposition to successively, and
sometimes to effectively, or causally.

Thus, say the Schoolmen, the corruption of one thing
is the generation of another, not effectively, but consecutively:
that is, since matter cannot be without form, it is necessary,
that the generation of one thing follow upon the corruption
of another.

Consedia, in Ancient Geography, a piece of Gallia
Lyonnaesis, situated, according to the Itinerary of Antoninus,
between Comisae and Parium Marius.

Conseil de Guerre, Fr. Council of War. This is
composed of the general in chief, and the general officers
of the army, which he commands, whether it be held for
the purpose of deliberating among themselves on the mea-
sures they ought to pursue in a difficult conjuncture, of an
offensive or defensive nature or otherwise; or for some act
of military justice; or for accepting, regulating, stipulating,
or refusing articles of a proposed capitulation; or for es-
tablising rules and regulations for the police and discipline
of the troops; or, in fine, for judging of any military crime or
discharge.

Conseil de Guerre secrét, Fr. A secret council
of war. A secret council held by the king and his ministers
for deliberating on a defensive, offensive, or federative
war.

Consent of Parts, in the Animal Economy. See
Sympathy.

Consent of the Parties, in the Law of Succession.

Consentes, in Mythology, derived from the old
Latin consa, consel, denote twelve superior deitites among
the Romans, or the "di majorum gentium," who were ap-
prehended to belong to the council of Jupiter. They were
comprehended by Ennius in the following districts:

"Juno, Vesta, Minerva, Ceres, Diana, Venus, Mars,Mercurius, Jovis, Neptunus, Vultanus, Apollo." Tho
ioe which were esteemed the superior deities, and were
the principal objects of the pagan worship, had been men,
according to Cicero (Tacl. Diu. lib. i. c. 12, 13); and
this was taught even in the mysteries. Varrus men-
tions twelve deities under the same denomination, who superin-
tended agriculture. Lib. i. De Re Rustica.

These confestes had a temple at Putei in Italy; and
they had their common altar at Athens, as Plutarch (in Nicia)
informs us. Aristophanes says, it was usual to swear by
them. In ancient inscriptions they are thus marked: J.O.M.
i. Jovis optima maxima, Catenis Di Consen-
tibus. They were also called "Dii magni," "caelestes,"
or "nobles," and are represented as occupying a different
part of heaven from the inferior gods, who are called "Plbs,"

Consentia were feasts instituted in honour of these
deities.

Consentia, in Ancient Geography, Cosenza, a town
of Italy and capital of the country of the vastis by whom it
was built. It was situated on the small river Crthus.
Alexander, king of Epirus, surpursed it in his expedition
into Italy. See Cosenza.

Consequent, in Logic, the conclusion of a rea-
oning, or argument.
Anciently there were appointed conservators of treaties of peace between princes; and these conservators became judges of the infractions made on a treaty, and were charged with procuring satisfaction to be made. They were usually the feudatories of the several powers. In lieu of conservators, princes now have recourse to other indifferent princes to guarantee their treaties. See Guarantee.

Conservator of the peace, in our Ancient Customs, was a person who had an especial charge, by virtue of his office, to see the king's peace kept.

Till the erection of justices of the peace by king Edward III., there were several persons who by common law were credited in keeping the peace; some having that charge as incident to other offices; by others simply, or of itself, called eybode, or conservators of the peace. Those that were so by virtue of their office still continue; but the latter are superseded by the modern justices.

The chamberlain of Chelft is still a conservator in that county; by virtue of his office. 4 Ind. 102.

Sheriffs of counties at common law are conservators of the peace; and constables, by the common law, were conservators, but some say they were only subordinate to the conservators of the peace, as they now are to the justices.

The king's majesty is, by his office and dignity royal, the principal conservator of the peace within all his dominions; and may give authority to any other to see the peace kept, and to punish such as break it: hence it is usually called "the king's peace." The lord chancellor, or keeper, the lord treasurer, the lord high steward of England, the lord marshal, the lord high constable of England, (when theSheriffs are in being,) and all the justices of the court of King's Bench (by virtue of their offices,) and the master of the rolls (by prescription) are general conservators of the peace throughout the whole kingdom, and may commit all the breakers of it, or bind them in recognizances to keep it. The other judges are only so in their own courts. The coroner is also a conservator of the peace within his own county; as also the sheriff; and both of them may take a recognizance or security for the peace. Constables, tithing-men, and such like, are also conservators of the peace within their own jurisdiction; and may apprehend all breakers of the peace, and commit them till they find sureties for their keeping it.

Those that were, without any office, simply and merely conservators of the peace, either claimed that power by prescription, or were bound to execute it by the tenure of their lands; or, lastly, were chosen by the freemen in full county court before the sheriff; the writ for their election directing them to be chosen "de probioribus et potentioribus comitatus sui in custodes pacis." But when queen Elizabeth, the wife of Edward II., had contrived to depose her husband by a forced resignation of the crown, and had set up his son Edward III., in his place, this being an unprecedented measure, caused an alarm; and, therefore, in order to prevent any insurrections, and disturbance of the peace, the new king sent writs to all the sheriffs of England, indicating the manner of his obtaining the crown, and commanding each sheriff to keep the peace throughout his bailiwick, on pain and peril of disfranchisement and loss of life and limb. Soon after it was ordained in parliament, that for the better maintaining and keeping of the peace in every county, good men and lawful, who were no maintainers of evil, or barreters in the country, should be affiliated to keep the peace. Thus, and at this time, the election of conservators of the peace was taken from the people, and given to the king; such affiliation being conformed to.

The two premises of a syllogism being granted, the consequence must also be granted.

In a more restrained signification, consequence is used for the relation or connexion between two propositions, whereas one follows, or is inferred, from the other. Thus: It is an animal, and therefore feels.

Consequent, the last proposition of an argument; being something deduced or gathered from a preceding argumentation. An ethymone only contains two propositions, the antecedent and consequent: if the antecedent be absurd, the consequent must be false too.

Consequent, in a more precise sense, is used for the proposition which contains the conclusion, considered in itself, and without any regard to the antecedent; in which sense, the consequent may be true, though the consequence be false.

Consequent of a ratio, in Arithmetic, the latter of the two terms of a ratio; or that to which the antecedent is referred. See Proportion.

Thus, in a : b, or a to b, b is the consequent, a the antecedent.

Consequents, in Rhetoric, are also used to signify such things as being allowed, necessarily, or very probably, infer their antecedents. Thus with respect to a substance, it is correlative, and therefore material.

Consequent, in the Italian Musici, is used to signify concords, or those intervals which accord pleasantly, be they either perfect, as the fifth and eighth, or imperfect, as the third, sixth, &c. See Octave.

Consequent, a motion in consequitans is a motion in the order of the signs of the zodiac.

Consequential Damages, in Law. See Damage.

Consequence, Ital. a term in Music, used by Zarlino and other old authors, instead of Fuga; but F. Martini makes it synonymous with Riposta, or reply to a subject given.

Conerans, or Conerans, in Geography, the name, before the revolution, of a country in France, in Gallesy, and the diocese of a bishop, who resided at St. Liger, the capital; it was bounded on the east by Foix, on the south by Catalonia, and on the north and west by Connings.

Conservation, in Ontology, denotes giving duration, or continuance in existence to all creatures; in contradistinction to creation, which gives existence to all created substances. Some of the ancient schoolmen have represented conservation as a continued creation; to which it has been objected that as God, whenever He creates a substance, must create it with all the properties, modes, and accidents which belong to it, it will follow, that be must at the same time create or give being to, all their final though s and inclinations, and even their most criminal and abominable actions; or, in the most complete sense of the term, be the author of sin. Wett's Philos. Eff. Eff. xii § 4.

Conservative Suture. See Suture.

Conservator, an officer established for the security and preservation of the privileges granted to some cities and communities; or, a person who has a commission to judge of, and decide, the differences arising among them. In most Catholic universities, there are two conservators; the conservator of royal privileges, or those granted by kings; and the conservator of apostolical privileges, or those granted by the pope. The first takes cognizance of personal and mixed causes between the regents, students, &c. and the latter of spiritual matters between ecclesiastics.

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CONSERVATORIO, Ital. a title given in Italy to almost all charity-schoo?; but chiefly to those where children are taught music, and are otherwise educated with a view to that profession. The conservatorio in the city of Venice have been much celebrated by all travellers previous to the revolution; it had four of these schools: the Ospedale della Pietà, the Mendicanti, the Incurabili, and the Ospedale di S. Giovanni e Paolo, at each of which there was a performance every Saturday and Sunday evening, as well as on great festivals. At these, the performers, both vocal and instrumental, were all girls; the organ, violins, flutes, violoncellos, buffoons, and even double-basses, kettle drums, and French-horns, were supplied by females. Each of these establishments was a kind of founding hospital for natural children and orphans, under the protection of several nobles, citizens, and merchants, who, though the revenue is very great, yet contribute annually to its support. These girls are maintained here till they are married, and all those who have talents for music are taught by the best masters of Italy.

There were three conservatories in the city of Naples, for the education of boys who were intended for the profession of music, of the same kind with those of Venice, for girls. As the scholars in the Venetian conservatories have been chiefly celebrated for their talent and merits of execution, so those of Naples have long enjoyed the reputation of being the first contra-puntists, or composers in Europe. It is from these seminaries that Italy, and all Europe, have been delighted with the genius and talents of the two Scarlatti, Vinci, Leo, Pergolesi, Porpora, Farinelli, Cafarelli, Giazziello, Durante, Jonelli, Perez, Piccini, Trueta, Anfetti, Sacchini, Pacchierii, and innumerable others of the first eminence among composers and performers both vocal and instrumental.

CONSERVATORY, in Gardening, a place contrived somewhat in the manner of the green-hose, but more spacious and elevated, and finished in a neater and more perfect manner; being designed for containing and preserving the more rare and curious sorts of exotic plants, as well as for affording amusement by being provided with walks laid with some sort of neat material, according to the taste of the proprietor, in a serpentine or other irregular manner between the plants.

Houses of this nature should have dry and rather elevated situations, at a small distance from the residence, and be ranged in such a manner as to have the benefit of the sun as much as possible during the day. They must likewise be provided with fires for the purpose of communicating heat when it may be necessary, and also valves and other contrivances for the introduction of fresh air when wanted, and to afford due ventilation.

The sides, ends, and roofs, must be formed with glass, as in the green-house, in order to admit light freely, and at the same time protect the plants.

It has been generally considered as synonymous with green-hose; but its principle or essential difference consists in this, that in the latter the trees and plants are either in tubs or pots; and placed on beds or shelves through the winter, whereas in the former the ground is laid out in beds and borders made up of the finest compositions of soils or of earthy materials that can be procured, three or four feet in depth; in which the trees and plants, taken out of their tubs or pots, are regularly planted, in the same manner as hardy plants in the open air. And instead of taking out the plants in the summer, as in the green-house, the whole of the glass roof is taken off, and the plants exposed to the open air; when, on the approach of autumn, the lights are again put on, and remain so till the first frosts of the season shall fix such as that they can be removed without danger from cold.

In cases of necessity, it is evident however, that these buildings may also be used as green-houses by introducing stages instead of beds, in which case the glass roof should be fixed. Other conveniences may be attached to them, such as retiring rooms, bed rooms, aviaries, &c. Some buildings of this sort are, according to the editor of Miller's dictionary, formed so as to have one of the wings facing the south-east, and the other the south-west, so that from the time of the sun's first appearance upon any part of the building, until it goes off at night, it may be constantly reflected from one part to the other, and the cold winds be also kept off from the front of the centre building. In the area of the adjoining rooms or wings, many of the more tender exotic plants may be placed in the summer season; and in the spring before the plants can be let out. The beds and borders of this area may be full of amenities, ranunculuses, early tulips, &c. which will be part flowering, and the roots fit to take out of the ground, by the time the plants are taken out of the house. In the centre of this area may be a small basin of water, which will be very convenient for watering the plants, not only on account of its nearness, but because the water will be softened and warmed by the reflection from the glass. And the wing facing the south-east should always be preferred for the warmest, or bark-floe, because the sun, at its first appearance in the morning, shines directly upon the glass, and warming the air of the house, gives new life to the plants, after the long nights of the winter season.

It is also farther observed, that in these buildings, if there are not sheds running behind them their whole length, the walls should not be less than three bricks thick, and if they are even more it will be better, because where the walls are thin and exposed to the open air, the cold will penetrate; and when the fires are made the heat comes out through the walls, so that it will require a larger quantity of fuel to maintain a proper temperature of warmth in the houses; and in general, the colder and better these houses are built, the less fuel will be required to warm them, so that the
CONSERVE, in Pharmacy, &c. a dry confect, or form of medicine, or food, contrived to preserve the flowers, leaves, roots, peels, or fruits of several simples, as near as possible to what they were when fresh-gathered; and to give them an agreeable taste.

Con verses are compositions of recent vegetable matters and sugar beaten together into an uniform mass. Vegetables whose virtues are lost by drying, may be preserved in this manner for a considerable time unimpaired, the sugar preventing the natural decomposition and moulding which would otherwise take place.

The preparation of the conserves is as simple as possible. The sugar is first ground to fine powder, and then mixed by long beating (not by solution) with the vegetable pulp or other material. No heat or other mode of preparation is employed, so that the vegetable matter remains as nearly as possible in the state in which it existed in the plant at the moment of gathering. The conserves directed by the London college are those of hips, roeses, floes, arum and squills. Of these the two last alone can be considered as active medicines; and the arum is exhibited with peculiar efficacy in this form, as its pungency to the palate is a little lessened, whilst its internal stimulating powers remain unaltered.

The conserve of arum, or cockow-pint, is a composition of arum bruised, half a pound, and double refined sugar, 1 pound, beaten together in a mortar. Those who hold in veneration the integrity and experience of Sydenham, will have no doubt of the effects of this medicine in rheumatic cases. This conserve may be given to adults in doves of a dram.

The conserve of the hip, or "conserve cynoblati," is formed by mixing one pound of hips with 20 ounces, by weight, of double refined sugar, powdered. This pulp should be separated with great care from the rough prickly matter including the seeds; a small quantity of which, retained in the conserve, is apt to occasion an unpleasing acrid to the stomach, a pruritus about the anus, and sometimes vomiting.

The conserve of the floes, "conserve pruni sylvetris," is prepared by putting the floes in water upon the fire, that they may soften, taking care that they do not burn; then taking them out of the water, prelling out the pulp, and mixing it with three times its weight of double refined sugar.

The conserve of squills, "conserve folliculi," is made by beating together in a mortar one ounce by weight of fresh squill with five ounces by weight of double refined sugar. This conserve is directed to be prepared in a small quantity, in order to guard against its variation in strength. It may be given to adults, from half a dram to two scruples, or more; especially when fresh.

For the conserve of fruit-wood, the outer rind of the Seville orange, sword-foresh, and of the red rose; pluck the leaves from the footstalks, and the unblown petals from the calyx, cutting off the heels: take off the outer rind of the oranges with a grater: when you have thus prepared them, bruise them with a wooden pelle in a marble mortar; and then beat them up with three times their weight of double-refined sugar, until they are mixed. The sugar should be powdered by itself, and passed through a sieve, before it is mixed with the vegetable mass; otherwise it cannot be properly incorporated. Rose buds, and some other vegetables, are usually prepared for mixing with sugar by a small wooden mill, contrived for that purpose. All the conserves are to be kept in close vessels, especially those of arum and squill.

With regard to fruits, as currants, &c. they are placed on the fire to make them yield their juice, then drain and strain them, and thicken what comes from them over the fire; and add to it the sugar. This last sort of conserve is particularly called a jelly; which see.

CONSERVES, Fr. in Military Language. See Counter-guard, or contre-garde, the names by which this work is usually and well known.

CONSETT Day, in Geography, a bay on the N.E. coast of the island of Barbadoes, N. of Consett's point, which is a cape, 10 miles N.E. of Bridge-town.

CONSETTI, Antonio, in Biography, an historical painter, native of Modena, where he enjoyed considerable reputation, in the last century. He was born in the year 1636, and is said to have been successively the disciple of his countrymen Francesco Stringis, and Donato Creti of Bologna, from whose precepts and example he acquired a correct style of drawing, and facility of composing. Unfortunately, however, his colouring is deficient of those charms of union and softness, which captivate the eye at first sight. The principal part of the life of this artist was spent in the state of Modena, where his pictures are by no means uncommon, and where he died in 1766. Lanzi. Storia Pittorica.

CONSIDERATIO curiæ, in Law, terms often occurring in law proceedings, and where matters are determined by the court. "Ideo consideratorium pro curia," i.e. therefore it is considered and adjudged by the court. Consideratio curiæ, &c. denotes the judgment of the court.

CONSIDERATION, the material cause, or quid pro quo, of any contract, and without which no contract is obligatory or binding.

This consideration is either expresse, as if a man bargain to give ten guineas for a horse, or to sell his land for a certain sum, or to grant it in exchange for other lands, &c.; or when a person agrees for a stipulated sum to do a thing; or implied, when the law itself enforces a consideration; as if a man coming into an inn, take meat, drink, and lodging for himself and horse, the law presumes he intends to pay for them, though there be no express contract between him and his host: and if he discharges not the house, the host may hoo his horse.

Considerations may be regarded either as pertaining to contracts generally, or to deals in particular. As to contracts, consideration may be defined to be the reason which moves the contracting party to enter into the contract. The citizens hold, that in all contracts, either express or implied, there must be something given in exchange, or something that is mutual or reciprocal. This thing, which is the price or motive of the contract, is called the consideration; and it must be a thing lawful in itself, or else the contract is void. A good consideration is that of blood or natural affection between near relations; the satisfaction accruing from which the law eleemos an equivalent for whatever benefit may move from one relation to another. (3 Rep. 83, 1 Inl. 271.) This consideration may sometimes, however, be lost aside, and the contract become void, when it tends in its consequences to defraud creditors or other third persons of their just rights. But a contract for any valuable consideration, as for marriage, for money for work done, or for other reciprocal considerations, can never be imputed
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peached at law; and, if it be of a sufficient adequate value, is never set aside in equity: for the person contracted with has then given an equivalent in recompense, and is therefore as much an owner, or a creditor, as any other person. These valuable considerations are divided by the civilians into four species. 1. Do, ut des; as when I give money or goods on a contract to receive in return money or goods: of this kind are all loans of money upon bond, or promise of repayment, and all fakes of goods, in which there is an express contract to pay so much for them, or else the law implies a contract to pay as much as they are worth. 2. Facio, ut facias; as when I agree with a man to do his work for him, provided that he will do mine for me; or if two persons agree to intermarry; or to do any other positive acts on both sides: or, to forbear on one side, on consideration of something done on the other, as that in consideration A, the tenant, will repair his house, B, the landlord, will not sue him for want; or, for mutual forbearance on both sides. 3. Facio, ut des; as when a man agrees to perform any thing for a price, either specifically mentioned, or left to the determination of the law to set a value on it. Thus, when a servant hires himself to his master for agreed wages, he contracts to serve his master for that specific sum: or, otherwise, if he be hired generally, he is under an implied contract to perform this service for its reasonable worth. 4. Do, ut facias; as, when I agree with a servant to give him such wages upon his performing such work, which is the last species inverted; for fereus facit, ut herus det, and herus dat, ut fereus faciat.

A consideration of some sort or other is so absolutely necessary to the forming of a contract, that a nudum pactum, or agreement to do or pay anything on one side, without any compensation on the other, is totally void in law; and a man cannot be compelled to perform it. (Dr. and Stud. l. 2, c. 24.) Thus, if one man promises to give another two l., nothing is contracted for or given on the one side, and therefore nothing is binding on the other. And, however a man may or may not be bound to perform it, in honour or conscience, which the municipal laws do not decide; those laws will certainly not compel the execution of what be had no visible inducement to engage for; and, therefore, our law has adopted the maxim of the civil law, that "ex nudo pacto non oritur actio." But any degree of reciprocity will prevent the pact from being null; nay, if even the thing be founded on a prior moral obligation (as a promise to pay a just debt, though barred by the statute of limitations), it is no longer nudum pactum. And as this rule was principally established to avoid the inconvenience that would arise from setting up mere verbal promises, for which no good reason could be assigned, it therefore does not hold in some cases, where such promise is authentically proved by written documents. For if a man enters into a voluntary bond, or gives a promissory note, he shall not be allowed to set up the want of a consideration in order to evade the payment; for every bond from the solemnity of the instrument, and every note from the subscription of the drawer, carries with it an internal evidence of a good consideration. Courts of justice will therefore support them both, as against the contractor himself; but not to the prejudice of creditors or strangers to the contract. Plowd. 308, 309. Hard. 4. 1 Ch. Rep. 157. Ld. Raym. 760. Fonsbanque, Treat. Eq. 334. n.) See Contract.

With regard to deeds, it may be observed, that they must be founded upon good and sufficient consideration; not upon an amiable contract (lat. 13 Eliz. c. 8.); nor upon fraud or collusion, either to deceive purchasers bona fide (lat. 27 Eliz. c. 4.); or just and lawful creditors (lat. 13 Eliz. c. 5.); any of which bad considerations will vacate the deeds, and subject such persons as put the same in use, to forfeitures, and often to imprisonment. A deed also, or other grant made without any consideration, is, as it were, of no effect; for it is construed to enure to, or to be effectual, only to the use of the grantor himself. (Park. § 533.) The consideration may be either a good or a valuable one. A good consideration is such as that of blood, or of natural love and affection, when a man grants an estate to a near relation; being founded on motives of generosity, prudence, and natural duty. A valuable consideration is such as money, marriage, or the like, which the law deems an equivalent given for the grant (3 Rep. 83.); and is therefore void, unless the consideration is sufficiently adequate. Deeds made upon good consideration only, are considered as merely voluntary, and are frequently set aside in favour of creditors, and bona fide purchasers. See Deed.

A mere voluntary curtesy will not be a good consideration of a promise; but the value and proportion of the consideration is not material for maintaining an action, whether it be a penny or 100 l.; but a jury will give damages proportionable to the loss. (Hob. 5. 10 Rep. 76.) A consideration that is void in part, is void in the whole; and if two considerations be alleged, and one of them is found to be a good consideration, the other consideration stands. (Hob. 126. Cro. Eliz. 848.) But if there be a double consideration for the grounding of a promise, for the breach of which an action is brought; though one of the considerations be not good, yet if the other be good, and the promise broken, the action will lie upon that breach; for one consideration is sufficient to support the promise. (1 Lill. 297.) A consideration must be lawful, to ground an affrumpet. (2 Lev. 161.) Where considerations are valuable, and consist of two or three, as a consideration of wages for the performance of every part, ought to be sworn. (Cro. Eliz. 579.) In case a deed of feoffment be made of lands, or a fine and recovery be passed, and no consideration is expressed in the deed, &c. for the doing thereof, it shall be intended by the law, that it was made for the use of the feoffor or conuor; for it shall be presumed he would not part with his land without a consideration; and yet the deed shall be construed to operate something, and that which is most reasonable. (4 Lill. Abr. 299.) Blackf. Com. vol. ii. Jacob's Law Dict. by Tomlins.

CONSIGLIONE, in Geography, a town of the island of Sicily, in the valley of Mazara; 19 miles S. of Palermo.

CONSIGNE, Fr. parole or counter-sign. When used in the masculine gender, it also means a person formerly paid by the French government for residing constantly in a garrisoned town in order to take cognizance of all persons that entered by the gates or went out of them. He had a place allotted to him, and regularly delivered a report to the governor or commandant of the place.

Consignee. A person who could not pass the post, or quit the house, to which the order of his superior had assigned him.

CONSIGNMENT, or Consignation, the depositing any sum of money, bills, papers or commodities, in sure hands; either by order of a court of justice, in order to their being delivered to the persons to whom they are adjudged; or voluntarily, in order to their being remitted to the persons they belong to, or sent to the places they are defined for.

Consignment of goods, is the delivering or making them over to another. Thus goods are said to be consigned to a factor,
factor, when they are sent to him to be sold, &c., or when a factor sends back goods to his principal, they are said to be confirmed to him.

CONSILNIUM, in Ancient Geography, a town of Italy, in a gulf between Brutium and Zephyrium, according to P. Mela. Frontinus says, that it was a Roman colony, and places it in Lucania.

CONSILNIUM, diei consilia, in Law, was a time allowed for the accused to make his defence, and to answer the charge of the accuser. It is now used for a speedy day appointed to argue a demurrer; which the court grants after a demurrer joined, on reading the record of the cause. See Imparlance.

CONSILI M Casu. See Casu.

CONSISTENT. See Consist.

CONSISTENCE, a state of rel, wherein things capable of growth or decrease, continue for some time at a stand, without either.

This term is particularly used with regard to trees, for the time, or age, beyond which they do not grow, and yet at which they do not decline.

Thus we distinguish three states or stages of a tree: its growth, confidence, and return: and these are common to all trees, even fruit trees.

The confidence of an oak is from fifty to a hundred and sixty years: some, however, hold, that their confidence only commences from a hundred years; affording that they grow till that time, and that they continue in that state of perfection to two hundred years of age.

Consistence, in Physic, is that state of a body wherein its component particles are so connected, or entangled among themselves, as not to separate or recede from each other.

Consistence only differs from continuity in this, that confidence implies a regard to motion or relf, which continuity does not; it being sufficient to denominate a thing continuous, that its parts are contiguous to each other.

When used relative to a disease, it imports the crisis or acme thereof: when applied to the humours, excrements, or excretions, it imports their state as to thicknes or thinnes.

Consistence is particularly used with regard to bodies considered as they are more soft, or more hard, more liquid, or more dry.

Forms of medicines, as electuaries, lambatives, boluses, syrups, ungues, &c. differ chiefly in confidence.

Not only the gratefulness, but also the operation, of medicines, depend in some measure on their confidence; for medicines of a thick confidence are taken into the stomach, and penetrate into the body with greater difficulty than such as are thin and liquid; and it requires more trouble to swallow a thick than a thin medicine: for this reason thick medicines are generally nauseous and ungrateful; and this is the reason why cathartic boluses are often dissolved in some agreeable liquor, since in this form they are more grateful than in any other: for this reason also apozems are generally clarified by whites of eggs, or a fraiser.

On the contrary, a thick confidence is on some occasions more to be desired; in ulcers of the aspera arteria, and esophagus, for instance, where we must give medicines made up with gum tragacanth, or other substances of a like nature, which by their viscidity fix the medicines, as it were, longer to the part affected.

CONSISTENT Bodies, is a term used by Mr. Boyle, for such as we ordinarily call firm, or fast bodies; in opposition to fluid ones.

That author has a particular essay on the atmosphere of consistent bodies; wherein he shews, that all, even solid, hard, ponderous and fixed bodies, do exhale or emit effluvia to a certain space all around them.

CONSISTENTES, in Church History, a kind of penitents who were allowed to assist at prayers, but could not be admitted to receive the sacrament.

CONSISTORIAL Advocate. See Advocate.

CONSISTORY, or Roman Consistory, denotes the college of cardinals; or the pope's senate, and council, before whom judicatory cauæs are pleaded.

De-Cange derives the word from consistorium; i.e. locus ubi consistoriis; used chiefly for a vestibule, gallery, or ante-chamber, where the courtiers wait for admittance; and called a consistorii multitudine.

The consistory is the first court, or tribunal of Rome: it never meets but when the pope pleases to convok it; the pope, præfides in it in person, mounted on a magnificent throne, and habited in his pontificals; on the right are the cardinal bishops and priests, and on the left the cardinals deacons.

The place where it is held, is a large hall in the apostolical palace, where princes and ambassadors of kings are received. The other prelates, prothonotaries, auditors of the rota, and other officers, are seated on the steps of the throne: the courtiers sit on the ground; ambassadors on the right, and consistorial and fiscal advocates behind the cardinals.

Besides the public consistory, there is also a private one, held in a retired chamber, called the chamber of papal-gayo; the pope's throne here being only raised two steps high.

Nobody is there admitted but the cardinals, whose opinions are collected, and called sentences. Here are first proposed and palled all bulls for bilipriacs, abbeys, &c. Hence bilipriacs, and abbeyes, are said to be consistorial benefices; in regard, they must be proposed in the consistory, the annates be paid to the pope, and his bulls taken.

Anciently they were elective; but by the concordat, which abolishes elections, they are appointed to be collated by the pope alone, on the nomination of the prince.

CONSISTORY was also the name of a court under Constantine, where he sat in person, and heard causes: the members of this court were called comites.

CONSISTORY is also used among the reformed, for a council or assembly of ministers and elders, to regulate their affairs, discipline, &c.

CONSISTORY, or Court Chrifian, in the English Law, is a council of ecclesiastical perons, or the place of justice in an ecclesiastical or spiritual court.

Every archbishop and bishop has a consistory-court, held, before his chancellor or commiffary, who is the judge, and supposed to be skilled in the civil and canon law, either in his cathedral, or in some other convenient place of his diocese, for ecclesiastical causes, arizing within their respective dioceses. In places of the diocese, far distant from the bishop's consistory, the bishop appoints a commiffary, commiffarius foracrorum, to judge in all causes within a certain district, and regifter to enter his decrees, &c. (2 Rol. Abr. 286. Seld. Hift. Tithes, 473, 444.) The spiritual court was anciently, in the time of the Saxons, joined with the county or hundred court; and the original of the consistory court,
court, as divided from those courts, is found in a law of the
Conqueror, quoted by Lord Coke.

From this court there lies an appeal to the archbishop of
each province respectively, by virtue of Stat. 24 Hen. VIII.

Consolation, one of the places in Rhetoric, where-
in the orator endeavours to abate and moderate the grief or
concern of another.

In consolation, a principal regard is to be had to the cir-
cumstances and relations of the parties. Scaliger considers
this exceeding well, De Arte Poetica. “The consoalator,
says he, is either a superior, an inferior, or an equal; with
regard, either to preferment, honour, wealth, wisdom, or
age. Livius is therefore to comfort Ovid, in a manner very
different from that wherein Ovid comforts Livius. Thus, as
to authority, a father and son, Cicero and Pompey, are to
conduct their consolations very differently: so in wealth,
as if a client should undertake to comfort Crassus: in wisdom;
as when Seneca comforts Polybius and his host: as to
age, there need no examples.”

“A superior may interpose his authority, and may even
chide; a wife may even dispute; sentences will become
him. An inferior is to shew respect and affection, and own
he had this from some wise or learned person: an equal
to appeal to their common friendship.”

Consolation, in Architecture, a bracket or projecting body
commonly in the shape of the letter S, which is used to sup-
port a cornice, vault, flat, statue, or even a column, as
in the barbarous architecture of the Diocletian palace at
Split.

Corbel is essentially the same thing as console, but
is generally confined to the description of Gothic building.

Consolation, in Bistry, Major; Baul. Pin. See
Symphoniurn officinale.

Consolatio medica; Baul. Pin. See Aegula.

Consolatio paliitris; Taber. See Seneo paliitris.

Consolatio regalis; Baul. Pin. Taber. Mon. See
Delphinium.

Consolation, in Law, the combining and unit-
ing of two benefits into one; Stat. 37 Hen. VIII. cap.
21. which union is to be by the allent of the ordinary, pa-
tron, incumbent, &c. and to be of small churches lying
near together.

The term is borrowed from the civil law; where it
properly signifies an union of the possession, or occupation,
with the property. Thus, if a man hath by legacy us-
fruitum fundi, and afterwards buys the property, or fee-im-
ple, of the heir: this is called a consolation.

Consolation, in Surgery, is the procès of nature, by
which a solution of continuity is united, either in a soft or
hard part of the body; and, as this procès was formerly
supposed to be within the control of surgeons, the remed-
dial applications employed for that purpose were denomi-
nated consolating medicins, or jarectics. Of this kind were
the different balsamic and refinous unguments, with all the
stimulating compositions containing turpentine. The sur-
genous may certainly vary the ingredients of his dressings in
such a manner to change the surface of a fore, and, in
many cases, so as to occasion a healing procès; but, after
all, he acts only as the hand-maid of nature, and is unable
to advance one step towards the consolation of a wound,
unless there be a previous tendency in the part to heal.

Warm stimulating applications will indeed cause a flow
of blood to the part wherein they are applied; and by ex-
citing the healthy action of blood-veffels, as well as by in-
creasing the sensibility of the skin or adjacent ulcerated sur-
face, they may promote suppuration, and even contribute to

Effect a cure, where it seemed unlikely before. In this
sense of the term, therefore, we may admit the existence of
consolating remedies.

Consonance, in Grammar, denotes a like cadence, or
close of words, periods, &c.

Consonances are ordinarily faults in discourse, especially in
English prose: though the ancients make a figure of them,
which they call quoniam. Too great a consonancy in the
rhymes has always an ill-effect.

Consonance, in Metre, signifies the union or agreement
of two sounds produced at the same time, and in this sense,
it includes all sorts of musical intervals, which naturally di-
vide themselves into three kinds, etc. The Concord, or such
sounds, as produce an agreeable and pleasing effect upon the ear,
see that article, 2d. Imperfect or tempered concords, which
are intervals nearly related to concords in respect to their
position in the scale, as explained when we were treating of
perfect concords, and also in partaking somewhat of the
pleasing effect of the concords to which they belong, when
not too much tempered; these are also further distinguished
by the phenomena of Brahs, see that article; and Imper-
fect Concord: and 3d. Discord, which are intervals that have
a grating or disagreeable jarring effect upon the ear, or
sometimes a fluttering roughness when nearly equal to an
imperfect concord, or to certain intervals in the scale, as
the notes major and minor, the tritone, semidiopt, and
other in effect, in defining consonance, “A passage of
several tunable sounds through the medium, frequently mix-
ing and uniting in their undulated motions, caufed by the
well proportioned commensurate vibrations of the resonous
bodies, and consequently arriving smooth and sweet, and
pleasing to the ear; as, on the contrary, diacutous, he main-
tains to arise from disproportionate motions of sounds, not
mixing, but jarring and clashing as they pass, and arriving in
the ear grating and offensive.”

This notion of a consonance exactly quadrates with that
we have already laid down for a concord. Accordingly, most
authors confound the two together; though some of the
more accurate dilhnguith with; making consonance to be
what the word implies, a mere concurrence of two or more
notes together, or in the same time; in contradistinction to
the motion of those touns in succession, or one after the
other.

In effect, the two notions coincide; for two notes, thus
played in consonance, constitute a concord; and two notes
that please the ear in consonance, will likewise please it in
succession. Notes in consonance constitute harmony, as notes
in succession constitute melody.

In the popular sense, consonances are either simple or
compound, &c. The most perfect consonance is unison; though
many, both among the ancients and moderns, differ it
from the number of consonances; as conceiving consonance
in agreeable mixture of different sounds, grave and acute;
not a repetition of the same found.

The second consonance is the othon; then the fifth, the
fourth, the thirds, and the sixths; the reil are multiples, or
repetitions of these.

Consonance is sometimes used by writers in the same
sense with concord; and thus, these are said to be variable,
and the term imperfect is prefixed when applied to intervals
which have a major and a minor of the same name, as thirds
and
and fithe, and perfect when applied to concords which never change their name, as the fifth, fourth, and octave; the absurdity of the use of the words perfect and imperfect is so apparent, that we wish to see them disused, and discontinue
theus in your books on music, in order that thes
terms may exclusively apply to intervals correctly tuned or perfect in respect of their accordance, or the reverse: there
was an impropriety in originally assigning one name to the
thirds and to the fifth, which naturally have no nearer relation
to each other, than the fourth and fifth, or octave and
unison, or even so much; but these being established in use,
may safely remain, without our continuing to confound and
reverse all ideas of perfection and imperfection, in con
sequence only of this defect in the musical nomenclature.

Consonants are said, by Dr. Smith, (Harmonics, p. 19.)
to be pure, where none of the equal times between the
pulses of the acuter found are subdivided by any intermediate pulse of
the graver; and interrupted when any of those equal times are interrupted by one or more pulses of the graver found.

See Cycls.

*CONSONANT, in Grammar, a letter which cannot be
perfectly founded by itself; but joined with a vowel, forms
an articulate sound, by a particular motion or contact of the
parts of the mouth: and hence the name consonant, q. d.
que sonant cum aliis.

A consonant, considering it philosophically, is nothing else but the modification of a sound, produced by means of the
organs of the voice, not a production of sound itself: thus,
commonly the sounds signified by the characters, a, r, t, o, u, &c. are differently modified when we say ah, than when
we say ae or au, ad or du; and these modifications are
called consonants.

Accordingly, Dr. Wilkins (Essay towards a real Char
acter, p. 72.) defines consonants to be those letters, in
the pronouncing of which the breath is intercepted, by
some collar or closure, among the instruments of speech:
and for this reason, he says, they are styled "clausa literarum,
"in contradistinction to vowels, which are "aperta." See
Vowel.

Consonants are divided into single, as b, m, q, &c. and
double, as x in auxiliary, corresponding to the κ of the
Greeks.

Consonants have been also divided into mutes and semivowels.
The mutes are such as cannot be found at all without a vowel, and all of which begin their sound with a
consonant; as b, d, g, k, p, f, t, and ch, being expressed
br, de, ge, &c. The semi-vowels have of themselves an
imperfect sound, and all begin with a vowel; as l, m, n, r, f,
t, &c. being found el, im, etm, &c. Four of these, viz.
l, m, n, r, are distinguished by the name of liquids, from
their readily uniting with other consonants, and flowing, as
it were, into their sounds. The mutes, as some writers
have described them, are those consonants whose sounds
cannot be protracted; and the semi-vowels are those whose
words can be continued at pleasure, partaking of the nature
of vowels, from which they derive their name. The mutes
may again be subdivided into pure, being those whose sounds
cannot be at all prolonged, as k, p, t, and impure, whose
sounds may be continued for a short time, as b, d, g. The
semi-vowels may be subdivided into vocal and aspirated: the former being formed by the voice, and the latter by the
breath. The vocal, which are eleven, are b, m, n, r, v, w, y, z, th flat, sh, ng; and the aspirated, five in number, are
f, h, j, wh, sharp, jh. The vocal semi-vowels may be subdivided
into pure, which are formed entirely by the voice, and
impure, which are such as have a mixture of breath with the
voice. Of the pure there are seven, viz. l, m, n, r, w, y,
and z; and four of the impure, viz. v, w, th flat, sh.

The popular writer, whose "Grammar" we are now citing, has
given the following list, exhibiting the sounds of the con
sonants, which are twenty-two in number.

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<th>Sound</th>
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<td>jh</td>
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Mr. Murray adds, that several letters marked in the Eng
lish alphabet, as consonants, are either spiratual, or re
present, not simple, but complex sounds. C, c, g, is super
fluous in both its sounds; the one being expressed by k,
and the other by g. In the soft pronunciation, is not a
simple but a complex sound; as age is pronounced age. J is
unnecessary, because its found, and that of the soft g, are
in our language the same. Q, with its attendant u, is either
complex, and reducible to ku, as in quality; or unnecessary,
because its found is the same with k, as in opaque. X is
compounded of gk, as in example, or of kt, as in respect.

See Murray's English Grammar, p. 4, &c. ed. 8.

Dr. Wilkins (ubi supr) disapproves of the common dis
vion of consonants into semi-vowels and mutes; and prefers
the distribution of them into three kinds, viz. spiratual or
breathed, semi-spiratual or half-breathed, and non-spiratual
or breathless. By the former he means such consonants as
require to the framing of them a more flory emission of the
breath, either through the nose or mouth; and he distin
guishes those that are formed by expiration through the nose
into sonorous, as m, n, ng, and mute, as bm, bn, and bg:
the sonorous being such as require some vocal sound for
framing them, and the mutes being other letters of the same
collection, pronounced by a flory emission of the breaths,
without any vocal sound. The spiratual consonants are
those that are formed by breathing through the mouth as all of two
kinds, viz. sonorous, as v, d, l, r, z, sh; and mute, as
f, th, bl, kr, f, and jh.

Semi-spiratual or half-breathed consonants are such as
are accompanied with some kind of vocal murmur, as b, d, g;
whereas those are denominated non-spiratual or breathless
which are wholly mute, as p, t, c. Thus, b and p are
framed when the breath is intercepted by the closure of the
lips; the first of them being more soft, with some kind of
murmur; the other more hard, and wholly mute. Again, a
and t are commonly framed by an appulse or collision of
the top of the tongue against the teeth or upper gums; the
first being more soft and gentle, with some kind of mur
mur; the other wholly mute. Moreover, g and e are
framed more inwardly, by an interception of the breath to
wards the throat by the middle or root of the tongue, with
such a kind of difference between them as subsists in the two former cases. The consonants already enumerated belong to the class of those that are simple; but those that are called compound are usually distinguished into such as are aspirated, and such as are double: the former seem to be blended with $b$, and are usually fo written; and the latter are compounded of some of the other letters, but for the sake of dispatch and brevity in writing, they are in several languages expressed by single characters, and reckoned in the alphabet as if they were distinct species of simple letters: such in the Latin alphabet are $q$ and $x$, and the double letter $ss$, whose power is the same as $ds$ or $ts$. The consonant $q$ is allowed to be a compound of $c$ and $u$; but what is the true original of $j$ consonant, and that power attributed to $e$ in the words charity, charity, &c. have not been completely determined. It is plain that neither of the letters $q$ or $x$ is a single letter, because in the pronunciation of them we do not end with the same sound with which we began: it seems, however, to be plain that $j$ consonant is a compound of $d$ and $zh$, and $eh$ of $t$ and $h$. As for the other three consonants that are reckoned in the common alphabet, $k$, $w$, and $y$. Dr. Wilkins thinks them unnecessary. If e, he says, be used always according to its proper power, $k$ must be superfluous; and therefore the Welch, who use $e$ for only one kind of sound, have no $k$. And as for the letters $w$ and $y$, their power is the same with that of the vowels $a$ and $i$, as will evidently appear when they are rapidly pronounced before any other vowel by way of diphthong, so as to make but one syllable, as in war, war; fan or twin, see or yes, soke or yoke. Upon the whole, Dr. Wilkins enumerates 34 simple letters, 8 of which are vowels, and 26 consonants, besides 24 diptonghs. See Letter.

According to some writers, the most natural division of consonants is that of the Hebrew grammarians; who have been imitated in this respect by the grammarians of all oriental languages; these divide the consonants into five classes; according to the five principal orders of the voice; which all contribute, it is true, but one more notably than the rest, to certain modifications, which make five general kinds of consonants. Each kind, or class, comprehends several consonants, which result from the different degrees of the same modification, or from the different motions of the same organs.

These organs are the throat, palate, tongue, teeth, and lips; whence the five classes of consonants are denominated guttural, palatal, lingual, dental, and labial.

We account fourteen consonants in the English alphabet, viz. $b$, $c$, $d$, $f$, $g$, $k$, $l$, $m$, $n$, $p$, $q$, $r$, $s$, $t$, $x$, $z$; to which there are three others to be added, viz. the $h$, and $j$ consonants, and $w$ consonant, which make the whole number of consonants nineteen: one whereof is guttural, viz. the aspirate $b$; five palatal, viz. $c$, as when pronounced before $a$, $o$, and $u$, as in cow, corn, curiosity; $g$, as in Gwen; $j$ consonant in jubil, $k$ in kernel; and $q$ in query. To these some have added $w$ and $y$, which are really consonants when they begin a word or syllable; although in every other situation they are called vowels. That they are consonants when used as initials seems to be evident, from their not admitting the article $a$ before them, and from their following a vowel without any hiatus or diffi ulty of utterance; that in other situations they are vowels appears from their regularly taking the sound of other vowels.

The four lingual consonants are $d$, $l$, $n$, $t$; the four dental are $r$, $s$, $x$, $z$; the three labial are $b$, $f$, $m$, $p$, and $w$ consonant.

With regard to which division it may be observed, that though the $g$ be modified in three different manners, as it comes before an $a$, an $o$, or an $u$; yet it is still a consonant of the palate; that the $j$ consonant differs in nothing but its figure from the $g$ before $e$ or $i$; that $h$ has the same pronunciation with the $e$; that $x$ comprehends the sound of two letters in its sound, viz. $e$ or $h$, and $j$ or another $e$, as in Alexander, and Alexis, which we pronounce as it wrote Alexander and Alexius; and that the $e$ before an $e$ or $i$, is no consonant of the palate, because in that case it loses its proper sound, and assumes the hissing sound of the $f$.

The abbot Dangeau thinks the nature of the division of the Hebrew grammarians to be very reasonable; but he does not acquiesce in the distribution they have made of them: to find a natural and full division of the consonants, he observes, no regard must be had to the characters that represent them; nor anything be considered but their sound, or the modification they give the sound.

On this principle, the same author finds in the French five labial consonants, $b$, $p$, $c$, $f$, and $m$; five palatal ones, $d$, $f$, $g$, $k$, $n$; four biffers, $j$, $w$, $y$, $h$; two liquids, $l$ and $r$; two that run into and mix with each other, as $ll$, and $nn$; which last, however, is peculiar to the French language; and the $h$ aspirate.

He adds, 1. That $m$ and $n$ are properly two nasal consonants: the $m$ a $b$ passed through the nofe, and the $n$ a $d$, in like manner, pronounced through the nofe; and, in effect, people with a cold pronounce barks for market, deed for need, &c.

2. That among the consonants, some are weak, others strong; their difference consisting in this, that the former are preceded with a small emission of the voice, which feizes them, which the latter have not. The weak are $b$, $c$, $d$, $g$, $j$, $l$; the strong, $p$, $f$, $t$, $k$, $s$, $x$, $z$.

It may be here observed, that when we speak of a person's talking through the nose, or of the red, only one organ is moved very strongly and sensibly, and the rest weakly.

It is hence also visible, that in all languages the aspirate, or guttural letters, are real consonants; since the throat modifies the sound as much as the palate, tongue, or lips.

Lastly, to find all the consonants that may be formed in any language, there needs nothing but to observe all the modifications that the sounds of speech will admit of, by which we shall have all the consonants practicable.

Dr. Hunter (Edinb. Trans. vol. ii.) in his investigation of the manner in which consonants are formed, distinguishes them in two different respects, viz. by the operation of the
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the breath which is employed to make them audible. There
are free positions, he says, by which the vocal found is to
be articulated: the frf is formed by the close junction of
the lips, so that no breath is suffered to tranpire, and the
just modification of this position is that called oral, when
the passage of the breath or found by the nose is flapped,
and thus are formed the letters p and b; and the second
modification, termed the nasal, is formed by breaking the
communication, or exit, by the nose, and suffering the
found or breath to pass that way; in which case the letter
m is founded. The second position is formed by the appli-
cation of the under lip to the fore-teeth of the upper jaw,
which do not form an absolute interruption to the breath,
but suffer it to pass in an audible manner, by means of the
restraint with which it is made to pass: and then are pro-
duced the letters s and z. The third position is formed by a
similar application of the tongue to the fore-teeth, and a
similar expression of the breath; these producing the two
consonants b and rb. The fourth position is formed by the
application of the point or fore part of the tongue to the
root of the same teeth, or fore part of the palate, which
position may be variously modified; as by applying the tongue
closely to the palate, so as to form an absolute interruption
of the breath, in a manner similar to that of the frf position,
which may be called the mute modification, and which seems
to form the consonants t and d. 2. The tongue is not kept
closely fixed to the palate, but suffer, the breath to be ex-
pressed by an audible manner, similar to those of opening the
second and third positions: this may be termed the shi-bih
modification, and is that by which are expressed s and z. 3.
The passage of the breath between the point of the tongue and
the palate is opened alternately in a quick and tremulous
vibration: this may be denominated the vibratory modification,
and serves to form the letter r. 4. The passage of the breath
or found is not interrupted in any degree, but it is made to
pass in a very peculiar manner through the mouth; for
this purpose the tongue is closely applied to the fore part
of the palate, but it is retracted on each side so as to leave
an empty space, and then a passage is preferred for the breath,
which goes under the tongue and out of the mouth: this
may be termed the liquid modification, and serves to form
the sonorous letter l. 5. The lateral passages opened for the
breath in the lalt modification are shut, and the found at
the same time is suffered to escape by the nasal passage,
as in the second modification of the frf position: this may
be denominated the nasal modification, and produces the letter
n. The frfih position is formed in all respects like the
fourth, but only by a movement part of the tongue and palate,
and has the same number of modifications, which correspond
in their nature, and may be denominated in the same man-
ner. Thus, the letters b and g are formed in the mute modi-
fication; b and g in the shi-bih: the guttural or Northum-
brian r in the vibratory; the Spanish l, or the French l,
moiulé, in the liquid; and the guttural n or the English
ng in the nasal modification. Having thus explained the
several positions of the organ, with their different modific-
tions, Dr. Hutton proceeds to illustrate the formation of
the consonants, and articulations of voice, by the action of
the breath and found. In all the positions of the articulating
organ, he says, there is either employed the simple aspira-
tion of the breath, or a sound produced in the wind-pipe,
and modified in the articulating organ. Thus, in all the
positions, and in several of their modifications, there are
produced two distinct articulators, according either as sound
is emitted along with the articulation, or only the breath
employed without any other found. Hence proceeds the
distinction of mutes and consonants among the articulators
of voice.

But in each of these distinctions of mutes and consonants,
it is necessary to make a sub-distinction, according as the
articulator is either perfect or imperfect, whether as a mute
or as a consonant. Each of these, the author explains in
the following manner: The perfect mute can only take
place in those positions in which the breath is absolutely in-
terrupted by the close or impervious organ; which does not
happen in the second and third positions, and is the
result of the modifications of the fourth and fifth. This mute
articulator is formed, either by interrupting the vocal
found with the close position, in which case it is a final ar-
citulator; or by beginning to express the vocal found in this
close position, when it forms, upon opening the passage, an
initial articulator. Of this kind there are just three articu-
lators, corresponding to the three positions in which the
organ may be absolutely closed, in relation to the exit of
the breath: these are p in the frf position, t in the fourth:
and k in the frfih position. The imperfect mute is formed
by emitting a guttural sound, or that of the wind-pipe, in
these three positions of the mute articulator. The found
here is extremely limited; for it is necessarily restricted to
that quantity of breath which may be expelled through the
found wind-pipe in compressing the air, or distending the
cavity of the close organ. These short found articulators
may therefore be termed imperfect mutes. The b, d, and g,
are the three imperfect mutes, corresponding to the three
absolute mutes, p, t, and k; of the frfih, fourth and fifth
positions. In the labilating articulators of the second and third
positions, and of the second modification of the fourth and
frfih positions, the breath may be continually emitted, either
with the simple expiration, or attended with the guttural
found. This, then, forms two cases of articulation, differ-
ing from each other, and also from the other two cases of
mute articulation; seeing that in the present case, whether
the consonant be formed with a guttural found, or only
an audible aspiration, it is a continued thing, and is not ne-
cessarily terminated, as in the mutes, by the close position of
the organ. Now, as in the case of mutes, we have the dis-
tinction of perfect and imperfect, with regard to that species
of letter, so, in the case of consonants, we have a species
which is perfect, and one which is imperfect. The imper-
fect species of consonant-articulators is formed in the four
labilating positions and modifications just now mentioned,
e.g. the f in the second position, the b in the third position,
the / in the fourth position, and the b in the fifth position.
To perfect those four consonants, we have merely to add the
guttural found to the continued expiration, and we then produce of the frf, the frfih, the frfih, the
b, the b, of the g, and of the /, the t. We have now only remaining the nasal modification of the frfih
position, which gives the consonant m; the vibratory modification
of the frfih and fifth positions, which give two species
of the letter m; the liquid modifications, which give two species
of the letter l; and the nasal modifications of those two
lateral positions, which give two species of the letter n. In
\n\nnone of all these is formed a distinct articulator, by means
of the simple aspiration; consequently all these are perfect
consonants. Our author observes, that the letter h is a
general articulator, which is formed in many different posi-
tions of the vocal organ. Diphthongs and consonant-vowels,
or rather articulating vowels, are formed in the following
manner: the diphthong, by founding both vowels equally
in the time of one; the consonant-vowel again, by an un-
equal division of this time, or by sliding quickly from the po-

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fitation of the two extreme vowels i and u, to the vocal sound which is to be thus articulated. See Vowel.

**Consonant.** is a term in **Majic,** which Dr. Calclott in his **Magical Grammar** applies to the concords, 2chave, 55th; 8th, thirds major and minor, and sixths major and minor. The consonant triads, or common chords, according to the same author are,

in the major mode \( \begin{align*}
\text{major} & : & \text{1} & \text{2} & \text{3} \\
\text{minor} & : & \text{3} & \text{1} & \text{2} \\
\text{1} & \text{2} & \text{3} & \text{1} & \text{2} \\
\text{2} & \text{3} & \text{1} & \text{2} & \text{3} \\
\text{3} & \text{1} & \text{2} & \text{3} & \text{1} \\
\text{1} & \text{2} & \text{3} & \text{1} & \text{2} \\
\end{align*} \) \( \text{See Triad.} \)

**Consort.** Queen. See Queen.

**Consonant.** in Botany. See Symphylum and Sollidago.

**Consound.** in Geography, a town of Poland, in the palatinate of Sandomierz; 28 miles S.E. of Radom.

**Conspiracy.** in Law, is taken for a combination or confederacy to do something evil, or illegal: though in the original sense of the word, and in its use in other languages, it signifies merely an agreement, whether for good, bad, or matters indifferent.

In our statutes and law books, conspiracy, in a general sense, is frequently confounded with maintenance, and chan- 

party.

**Conspiracy,** in its special signification, is used for a confederacy of two, at least, falsely to indict one, or procure him to be indicted of felony; who, after acquittal, shall have writ of conspiracy. See 52 Edw. 1. Stat. 2. 7 Hen. V. 18 Hen. VI. c. 12. The term is now commonly used for the unlawful combination of journeymen to raise their wages, or to refuse working, except on certain stipulated conditions; an offence particularly provided for by Stat. 2 & 3 Ed. VI. c. 15, revised, continued, and confirmed by Stat. 22 & 23 Car. II. c. 19 (now expired) which enables, among other things, that "if any artificers do conspire, that they shall not do their work but at a certain price, or shall not take upon them to do any other work, or shall do but a certain work in a day, or shall not work but at certain times, every person so confining shall forfeit for the first offence, 10l. or be imprisoned 20 days; for the second, 20l., or be pilloried; and for the third, 40l. or be pilloried, lose an ear, and become infamous." This statute appears to be yet in force, though it be not frequently referred to for remedy in this case; the proceeding being usually by indictment for conspiracy.

By the common law all conspirators wrongfully to prejudice a third person are highly criminal. 1 Hawk. P. C. c. 72. § 2. Stat. 5 Eliz. c. 4. Journeymen confederating and refusing to work unless for certain wages, may be indicted for a conspiracy, although the statutes which regulate their work and wages do not direct this mode of prosecution; for the offence culminates in the conspiring, and not in the refusal; and all conspiracies are illegal, though the subject-matter of them may be lawful. Thus also, a bare conspiracy to do a lawful act to an unlawful end is a crime, though no act be done in consequence of it. 8 Mod. 321. The fact of conspiring need not be proved on the trial, but may be collected by the jury from collateral circumstances. 1 Black. Rep. 592. Stra. 144. And if the parties concur in doing the act, although they were not previously acquainted with each other, it is conspiracy. 1 Hawk. P. C. c. 72. § 2. Writ of conspiracy lies for him that is indicted of a trespass, and acquitted, though it was not felony; also upon an indictment for a viti. 2 Mod. 326. 5 Mod. 465. Writ of conspiracy lies where a man is falsely indicted of any crime which may prejudice his fame or reputation; and though it doth not import fraud, if it endanger his liberty, or the indictment be injurious to his property, &c. 3 Salk. 97.

But though a conspiracy to charge falsely be indictable, yet the party ought to shew himself to be innocent; for the writ of conspiracy doth not lie without an acquittal. Mod. Ca. 127. 153. 156. Not only writ of conspiracy, which is a civil action at the suit of the party, but also action on the case in the nature of a writ of conspiracy, doth lie for a false and malicious accusation of any crime, whether capital or not capital, even of high treason; and this, though the bill of indictment be found ignoramus, or it doth not go so far as an indictment. And the same damages may be recovered in such action as in a writ of conspiracy, where the party is lawfully acquitted by verdict. 1 Rol. Abr. 111. 113. 9 Rep. 56. Gibb. Ca. 153. 19 Mod. 143. 212. Salk. 15. An action of the case is preferable, as it is more in use, and the proceedings more easy and not attended with such niceties as the writ of conspiracy.

If one falsely and maliciously procure another to be arrested, and bring before a justice of peace to be examined concerning a felony, &c. on purpose to vex and discourage him, and put him to charges and trouble, although he is not indicted for the same, yet he may have an "action on the case," in which he need not aver that he was lawfully acquitted, as he ought to do in a writ of conspiracy; but he may aver that the accusation was false et malitiose, which words are necessary in the declaration; and it must appear that there was no ground for it. And as an "action on the case" may be prosecuted against one person, where the writ of conspiracy or indictment doth not lie but against two, this action is most commonly brought. 1 Dauv. Abr. 258. 213. 2 Inf. 562. 638.

Conspirators may be indicted at the suit of the king, and at the common law, one may prefer an indictment against conspirators, though nothing be executed: however, the conspiracy ought to be declared by some act, or promise to stand by one another, &c. But a bare conspiracy will not maintain a writ of conspiracy, at the suit of the party, because he is not damaged by it, though it is a ground for an indictment. 9 Rep. 56; 2 Rol. Abr. 77. If the defendants can shew no foundation or probable cause of suspicion, they shall be discharged: and if a man hath good cause of suspicion, that a person is guilty of felony, and causes him to be indicted, in prosecution of justice, action of conspiracy will not lie; but it is otherwise if the prosecutor imposes the crime of felony, where no crime of felony was committed. 1 Rol. Abr. 115; 4 Rep. 438. Conspiracies ought to be out of court; for if a prosecution be ordered in a course of justice, and witnesses appear against a party, &c. there shall be no punishment; and if persons acted only as juries in a criminal matter, or judges in open court, there is no ground for prosecution. S. P. c. 173. 12 Rep. 24. If all the defendants but one are acquitted on indictment for conspiracy, this one must be also acquitted; because one person alone cannot be indicted for this crime: and husband and wife, being but one person, may not be indicted alone for a conspiracy. 2 Rol. Abr. 706. The acquittal of one person is the acquittal of another upon indictment of conspiracy (3 Mod. 220.) i.e., where only two are indicted, and it is not laid or proved that they conspired with others, unknown. However, where one is found guilty, according to the opinion of lord chief justice Hale, if the other doth not come in upon process, or if he dies...
CONSPIRATORS, in Mechanics, are all such as act in directions not opposite to one another. See Power, and Motion.

CONSPECIFIC. This appellation hath afforded ample matter of disquiet to learned antiquarians. History has traced it backwards from its introduction to England, through France, Germany, and Greece, to the imperial seat of Constantinople, in the days of Constantine the Great; and if we ascend farther towards the East, we shall find the term εἰδώλιον or εἰδωλαί in Palestine, which signifies in the times of the Old Testament, a flability, strength, or flay. Some trace of this word has been discoverable in the appellation of Laocoon at Troy, and particularly in that of Constantine, who was himself of oriental extraction, having sprung from Dardanus, a country of Upper Media, and from the former to have been descended from Dardanus and the Trojans. It is not improbable that this appellation of the emperor might have occasioned the adoption of the word into the Roman language about the same time. For it was at that period that the word contrariamente, obviously deduced from εἰδώλιον or εἰδωλαί, first became a name of dignity; and from thence was transmitted westwards, with some variation, according to the different genius of languages throughout the provinces. Amongst the Saxons the word was kæning or kæningas, from which, without doubt, we derive our word king. Moreover, the word flōle, flōla, flōhe, or flōbe, by an early transmutation of the several letters frequent in almost all languages, which seems to be the other confluence of the appellation contrariamente, is likewise common to the languages of the middle ages, and signifies a flammable place, division, or department, called by the Romans fiantio. According to this etymology, the word contrariamente signifies the flability or frailty of the place, or the strong man of the division. Those who derive it from the Saxon, discover contrariamente in kæning-præpel, denoting the support of the king. But others, as Sir Henry Spelman, and Dr. Cowl, considering that we borrow the name, as well as the office, from the French, deduce it, with greater probability, from that language; in which it is plainly derived from contrariamente, the matter of the flables, or perhaps of the horse, an officer well known in the empire; so called, because, like the great contrariamente of France, as well as the lord high contrariamente of England, he was to regulate all matters of chivalry, tilts, tournaments, and feats of arms, which were performed on horseback. Accordingly, they suppose, that the dignity, which at first was civil, in time became military, and the master of the flables was made general of the army.

CONSPIRATURE of England, Lord High, is an ancient officer of the crown, now disused in England, except on solemn occasions, as the king's coronation, and the like. The first contrariamente of England is said to have been created by the conqueror, who appointed Ralph de Mortimer, one of the principal commanders of his army; and the office continued till the reign of Henry VIII., A.D. 1521: when it became extinct, as the powers annexed to it removed to troubleshoot the king, by the attainer of the third duke of Buckingham, who derived it from the Bahamas, earls of Hereford, and in whom it was hereditary. Since this time there hath not been any permanent high contrariamente; but the office has been kept vacant, except on particular occasions. About a century after, viz. in 1677, it was also suppressed.
in France, by an edict of Louis XIII.; though the office has been exercised in the command of the marshals, by the first officer in the army. See Constable.

What authority and jurisdiction belonged to the constable, we may partly learn from a statute of the 13th of Richard II., in which it is said "that he ought to have cognizance of contracts touching debts of arms and of war out of the realm, and also of such things relating to arms or war within the realm, as could not be determined or discussed by the common law, with other usages and customs appertaining to the same matters, which other constables before that time had duly and reasonably used." Maxdor (Hist. Excheq. c. 11.) says, that he was a high officer, both in war and peace. As the duties enjoined on the constable and subconstable, as well in war as in peace, in home and in court, were munificent, honoured, and confidential; to the powers, privileges, authority, and pre-eminence of those officers, were extensive, judicial, executive, and respectable. The powers and functions of each of these high officers, when acting in their military capacities, were, in some instances, concurrent; in others, separate and independent. In the discharge of some official duties, they were upon an equal footing, and the marshal acted as coadjutor to the constable, but in others, the former was subordinate and servient to the latter. The functions of the constable, in his civil capacity, were few, and in a great measure restricted to certain personal attendances on the king in his court, on high feiths, and on occasions when such affairs were transacted as required pomp and solemnity. In his military capacity, the constable examined the number and qualifications of those who were lent by the military tenants, either into the field or garrison, and also of the dependents retained by the king, and gave them either their amittance or discharge. When the army took the field, and was commanded by a tought officer, the constable acted as his lieutenant, and was next to him in authority; but whenever the king was absent, the constable had the supreme and sole command of the forces. In both cases, the marshal was the substitute or vice-general of the constable. See Court of Chivalry, and Marshal.

From those mighty magistrates, the constables of England, are derived the inferior ones, since called the constables of hundred and frantiches: these were first ordained in the thirteenth year of Edward I. by the statute of Winchester (13 Ed. 1. flat. 2. c. 6.) which, for the contervation of the peace, and view of armour, and for preventing defaults of armour, and of the suits of towns and of highways, &c. appointed, that two constables should be chosen in every hundred and frantich. These are what we now call conslavarii capitaes, or high constables; because continuance of time, and increase of people, &c. have occasioned others of like nature, but inferior authority, in every town and parish, called petty constables, or sub-conslavarii, still instituted (as some say) about the reign of Edward III.

Although it has been a prevalent opinion, maintained by Coke, Hale, and others, that high constables are not more ancient than the statute of Winchester above cited; yet Hawkins concurs with others in maintaining, that both constables of hundreds, commonly high constables, and also constables of tythings, now denominated petty constables or tything-men, existed by the common law, and were not first ordained by the statute of Winton or Winchester; for that statute both not say, that such officers shall be constituted, but evidently seems to suppose that there were such before the making of it. 2 Hawk. 61. That the high constable was instituted long before the statute of Winton is a fact ascertained by a writ or mandate of Henry III., preferred in the Adversaria to Watts's edition of Matt. Paris, and from which chapters 4 and 6 of the statute of Winton are evidently taken. By this writ it is provided, that in every hundred there shall be constituted a chief constable, at whose mandate all those of his hundred, sworn to arms, should assemble and be obsequious to him, for the doing of those things which belong to the conservation of the king's peace. No mention of this officer, it is believed, can be anywhere found prior to the date of this instrument; which perhaps may no more determine the question as to his original creation than the statute of Winton. As for the "constable of the vii," or petty constable, as he is frequently called by way of distinction from the chief constable, this officer has been repeatedly acknowledged to be one of the most ancient officers in the realm, for the conservation of the peace (Poph. 13. 4. Inf. 265.). It must be confessed, however, that no mention of him by this identical name is anywhere found to occur anterior to the writ or mandate of King Henry III., already mentioned; by which it is also provided, that in every village or township there should be constituted a constable or two, according to the number of the inhabitants. But it is partly certain that lord Coke's idea is well founded, and that "this officer is actually owing to the institution of the frank-pledge, usually attributed to king Alfred," and was in fact originally the senior or chief pledge of the tything or decima. Hence it appears, that the ordinance of Henry III., far from instituting the office, merely enlarged the number of officers, placing them in towns and villages, instead of frantiches; hence it might frequently happen, that a manor of great extent had only a single constable for several townships; a case exactly similar sometimes occurring at this day, in which a township, comprehending several hundred, equally populous perhaps with itself, has only one constable for the whole. Upon the whole, it seems highly probable, that, at the common law, and before the mandate of Henry III., the constable of the hundred and the constable of the manor, were officers of the same nature and authority, originating at the same time and differing only as to the extent of their several districts; in short, that they bore to each other the same analogy as subsisted between the bailiff of the hundred and the bailiff of the manor. Hence it follows, that the constable of the hundred neither possessed nor could have exercised any more authority within the precinct of the latter, than the constable of one manor possessed or could have exercised in another; the manor being to all intents and purposes exempt from, and excluded out of the hundred.

High constables are chosen at the court leets of the frantich or hundred over which they preside, or, in default of that, by the justices at their quarter sessions, or by the greater number of the justices of the division: and they are sworn to the feiths, or by warrant from the feiths; which course hath often been allowed and conditioned by the justices of assize. Dall. c. 28. Salk. 170. And by Stat. 29 Geo. II. c. 25, 8. 9, in Welfinflur a high constable is to be elected annually by the dean or high eclewe, or his deputy at a court leet. But by 1 Geo. flat. 2. c. 13, high constables are required to take the oath of allegiance, supremacy, and submission, as other persons who qualify for offices; but they are not within the statute of the 25 C. II. c. 2, as to receiving the sacrament and subserbing the declaration against transubstantiation; and petty constables are exempted both from the one and from the other. The petty constables have two offices united in them; the one ancient, the other modern. Their ancient office is that of Headborough (which fey), tything-man, or...
or boritholder, who are as ancient as the time of Alfred; and
their more modern office is that of constable merely, which
was appointed (as it has been said) to lately as the reign of
Edward III., in order to afford the high constable. And, in
general, the ancient headboroughs, tything-men, and bor-
tholders, were made use of to serve as petty constables; though
not so generally, but that in many places they still continue
distinct officers from the constable.

The common law requires, that every constable should be
idoneus homi, i.e. apt and fit to execute the said office; and
in law he is said to be idoneus when he possesses three qualifi-
cations, viz. honesty, knowledge, and ability, (8 Rep. 4. b.)
And if one be elected constable, who is not idoneus, he by
the law may be discharged of his office, and another who is
idoneus appointed in his place. He must also be an inhabitant
of the place for which he is chosen, (12 Mod. 256.) nor
should he be the keeper of a public-house, (6 Mod. 42.)
which is made an express disqualification in Westminster, by
flat. 29 Geo. II. c. 25. Permits exempt from serving the
office of constable are aged persons, and in Westminster thos
63 years old are expressly exempted by flat. 31 Geo. II. c.
17, § 13;—aldermen of London;—the president, common
and fellows of the college of physicians in London, by 32
Hen. VIII. c. 40; but no other physicians, nor they else-
where:—apothecaries, practising in, or within five miles of
London, free of the company, or in the country having
twelve years, flat. 6 and 7 W. III. c. 41;—furgons, free of
the company of furgons in London, examined, approved,
and sworn, by flat. 5 Hen. VIII. c. 6: 32 Hen. VIII. c.
42: 18 Geo. II. c. 15; and by
custom all furgons (Com. Rep. 312.), and it seems by the
same flats. barbers free of that company in London;—attor-
nies of the courts of K. B. and C. P.;—practising barristers;
—diflancers, being teachers and preachers in a congregation,
tolerated by law, taking the oaths and making the required
declaration, but not others, by 1 W. c. 18. § 11:—foreign-
ers naturalized, who may rather be said to be incapacitated;
—militia-men, during the time of their service, by 26 Geo. III.
c. 107, § 130:—servants to members of parliament, but
doubtful;—prosecutors of felons to conviction; the original
proprietors, or first affiance of a certificate (commonly called
a tyburn-ticket), if a parish or ward office; within the parish
or ward where the felony happened, to be only once used, by
10 and 11 W. c. 23. § 231; but this is no exemption from
serving the office for a manor, nor, as it should seem, for
a vill or township; nor where the office is to be executed out
of the privileged district;—but matters of arts, judges of
peace in another county, officers of the guards, officers or
wardens and the Custum-house, tenants in ancient demesne,
and younger brothers of the trinity-house, cannot plead ex-
emption. If, however, a gentleman of quality, or a physician,
officer, &c. be chosen constable, where there are sufficient
persons besides, and no special custom exists; such persons, it
is said, may be relieved in B. R. 2 Hawk. P. C. 100. c. 10.
§ 41. A constable, whose office is ministerial, and not judi-
cial, may appoint a deputy; but the constable is answerable,
and his deputy ought to be sworn, though this is not in all
cases necessary; but if the deputy is allowed and sworn, the
principal is not responsible. Diflancers chosen to the office
of constable, &c. flealing to take the oaths, may execute the
office by deputy, who shall comply with the law in this behalf,
flat. 1 W. & M. c. 18. § 7. And by 31 Geo. III. c. 32.
the like privileges are given to Roman Catholics on their
taking and habening the oath and declaration therein spe-
cified. Constables may appoint a deputy to execute a war-
rant, when by reason of sickness, &c. they cannot do it
themselves. A woman made constable, by virtue of a cul-
tom, that the inhabitants of a town shall serve by turns, on
account of their eccles or houles, may procure another to
serve for her, and the custom is good.

Constables are chosen by the common law at the leet, or,
where there is no leet, at the town; sometimes by the
suitors, and sometimes by the reward, and now, in many
towns and parishes, by the parishioners: all according to
ancient and particular usage. But by whomsoever they
shall be chosen and appointed, they are to be sworn and
in their office by the lord, or his reward, or by the
sheriff respectively, as being judge in the matter. 2 Hawk.
62. If the constable be present when chosen, he is to take
the oath in court; if absent, he may be sworn before a
(single) justice of the peace: but in the latter case, he ought
to have special notice of his election, and a time and place
should be appointed for his taking the oath (well and truly
to serve the office). Every petty constable being a principal
peace officer, and it being necessary for the preservation of
the peace, that every vill should be furnished with one,
the justices of the peace have, ever since the institution of
their office, taken upon them, as conservators of the peace,
not only to swear the petty constables, who have been chosen
at a town or leet, but also to nominate and swear those who
have not been chosen at any such court, on the neglect of
the sheriffs or lords to hold their courts, or to take care that
such officers are appointed in them. And this power of
justices of the peace, having been confirmed by the unint-
terrupted usage of many ages, shall not now be disputed, but
shall be presumed to have been grounded on sufficient autho-
riety. Some have carried this point so far, as to allow the
justices, at their sefions, to swear one who was chosen at
the last, and unduly rejected by the reward, who had sworn
another in his place. 2 Hawk. 65. A constable has been
sworn by a single justice of the peace; and upon motion for
an information as not being duly sworn, the court held this
to be a good swearing. 2 Str. 14. It is certain that
justices of the peace had power to nominate and swear con-
stables, on the default of the town or leet, before the statute
of 13 & 14 C. I. c. 12; and therefore that they have such
authority in some cases not mentioned in that statute, which
enacts, that if a constable shall die, or go out of the parih,
any two justices may make and swear a new one, until the
lord shall hold a leet, or till the next quarter sessions, who
shall approve of the officer so made and sworn, or appoint
another; and if any officer shall continue above a year in his
office, the justices in their quarter sessions may discharge
him, and put in another, till the lord shall hold a court as
aforesaid. 2 Hawk. 65. 13 & 14 C. I. c. 12. § 15. It
seems to be clear at this day, that the King's Bench hath
power by mandamus to compel the court or judge to swear
a constable duly chosen. 2 Hawk. 65. And constables
lawfully chosen, if they shall refuse to be sworn, may be
bound over by a justice of the peace to the sheriff or sefions,
there to be indicted. Dalt. c. 28. 2 Str. 920. But it
seems that a justice hath no power to commit any person for
such refusal and no more, the proper mode being to indict
him upon his refusal; and if found against him, to affix a

Constables of London, which city is divided into 26 wards,
and every ward into precincts, in each of which is a constable,
are nominated by the inhabitants of each precinct on St.
Thomas's day, and confirmed, or otherwise, at the court of
wardment; and after they are confirmed, they are sworn in
to their office, at a court of aldermen, on the next Monday
after Twelfth-day. The oath of these constables is long and
particular, and comprehends a variety of duties, now seldom
performed, but regulated by articles of the Wardmote in-
quest,
CONSTABLE.

quell, which directs the conduct of the constable; who is a kind of superintendent of the morals of the inhabitants, and who ought to notice all new-comers, that these whole character is bad may be required to give security for their good behaviour, or be imprisoned. Catt. 130. 138. Every constable may execute warrants through the whole city. Such as are chosen into the office are obliged to place the king's arms, and the arms of the city, over their doors; and if they refuse in all cases, at the ends of such alleys, towards the streets, to signify that a constable lives there, and that they may be more easily found when wanted.

The general duty of all constables, both high and petty, is to keep the king's peace in their several districts; and for this purpose they are armed with very large powers, of arresting, and imprisoning; and of breaking open houses, and the like. One of their principal duties, arising from the statute of Winchester, which appoints them, is to keep watch and ward in their respective jurisdictions. See Ward and Watch.

If any one shall make an affray or assault upon another, in the presence of the constable, or shall threaten to kill, beat, or hurt another, or in a fury be ready to break the peace; the constable may commit him to the rocks, or other safe custody, and afterwards take him before a justice, or to a gaol, until he shall find surety for the peace; and if the party will not find surety to the constable, he may imprison the party till he shall find it, provided the offence be in his own view. Dalt. c. 1. Cru. Eliz. 375, 376. The duties of constables are so numerous and minute, in consequence of a variety of statutes, that the recital of them would extend this article beyond its due bounds. They will be found under several different heads or titles, that occur in this work.

If a constable neglect any duty incumbent on him either by common law or by statute, he may be indicted and fined by the justices of peace, to whom he is subordinate. If he will not return his warrant, or certify what he has done under it, he may be fined. If he wilfully lets a felon escape out of the rocks, and go at large, it is felony; and it seems generally agreed, that all voluntary escapes in the officer amount to the same crime as the offender was guilty of, whether treason or felony. 2 Hawk. P. C. c. 19. § 22, &c. It is a misdemeanor in him to discharge an offender, brought to the watch-house by a watchman in the night. In short, he is liable to various pecuniary, and sometimes personal, punishments, on neglecting the duty imposed on him by various statutes. As by his office he is subordinate to a justice of the peace, he is bound to execute his warrants; and therefore it hath been resolved, that where a statute authorizes a justice of the peace to convict a man of a crime, and to levy the penalty by warrant of distress, without paying to whom such warrant shall be directed, or by whom it shall be executed, the constable is the proper officer to serve such warrant, and inditcable for disobeying it. 2 Hawk. 262.

By 33 Geo. III. c. 55, two justices, at any special or petty se'ions, upon complaint upon oath, of any neglect of duty, or disobedience of any lawful warrant or order of any justice, by any constable, or other peace or parish officer, (such person being duly summoned to appear and answer to such charge,) may impove, upon conviction, any reasonable fine, not exceeding 40s., upon such constable, &c.; and if not paid, levy the same by distress and sale of the goods of such offender, to be applied to the poor of the parish or place where he resides; or for want of such distress, the offender shall be committed to the house of correction for any time not exceeding ten days. The officer executing such warrant, if required, shall draw the same to the perfon, whose goods and chattels are distrained, and suffer a copy of it to be taken. 27 Geo. III. c. 26.

On the other hand, the constable is protected by law, in the execution of his duty. By 7 & 9 Geo. I. c. 5, 27 & 28 Geo. II. c. 12. if any action is brought against a constable for any thing done by virtue of his office, he, and all who aid him, may plead the general issue, and give the special matter in evidence, and if he recovers, shall have double costs; but this must be certified on the record by the judge; and 19 Geo. II. c. 21. against profane swearing, gives treble costs. By 24 Geo. II. c. 41, no action shall be brought against any constable or others afflating him for any thing done in obedience to any warrant of a justice of peace, until demand of the perusal and copy of such warrant, and the facts have been refused or neglected for the space of six days, &c. &c. No action shall be brought against any constable but within six months after the act committed. For the charges of conveying malefactors to gaol, see COMMITMENT. By 27 Geo. II. c. 20, the constable executing a justice’s warrant, for levying a penalty or other sum of money directed by an act of parliament by distress, may deduct his own reasonable charges; and if any person shall be appointed to execute any warrant for felony, two justices may order by warrant under their hands a reasonable allowance to such special constable for his expenses and loss of time, to be paid by the treasurer out of the county rate. 41 Geo. III. c. 78. Two justices may in like manner order an allowance to be made to any high constable for extraordinary expenses incurred in the execution of his office, to be defrayed in the same manner. And by 28 Geo. II. c. 19, every constable, head-
to discharge a constable, the King's Bench may compel them by mandamus. 2 Hawk. 65. If a constable be discharged without just cause, the court of King's Bench will by rule of court order him to be referred to his place. Bull. 174.

**Constables of the Castles**, in Antiquity, were keepers or governors of the castles, or of great barons, who were frequently hereditary, or by feudal tenure; such were the constables of the Tower, the constable of London, or Baynard's castle, the constables of the castles of Dover, Windsor, Chelten, Caernarvon, and other castles in Wales; some of which offices, though not now hereditary, are remaining to this day. Their office seems to have been the same with that of the *castellani*, or governors of castles. These constables are those to whom Magna Charta (c. 17. 20.) refers; and who in the flat of Wefm. 1. (3 Ed. 1.) c. 15. are called constables of *fees*, and there considered as keepers of prisons; a distinct part indeed of all ancient castles. 2 Inst. 31. The statute of 5 Hen. IV. c. 10. reciting the oppressions of these constables, and enacting that none be imprisoned but in the common gaol, seems to have put an end to a race of tyrants, who, by their misdeeds, had rendered themselves odious to the people.

**Constable of France.** See *Constatel*.

**Constable, Provoost of the.** See *Provoost*.

**Constable**, in Biography, general of the Dominican order about the end of the sixteenth century, was born at Ferrara, to which city he was constituted inquisitor, and afterwards nominated master of the holy palace by pope Gregory XIII. In literary history he is known by a work entitled, "De canis in fatuo officio cognoscendis," which related to the history of the dreadful tribunal invented by the founder of his order. His own zeal in the duties of the office to which he had been chosen was exemplary; and to execute fatigue and over exertions occasioned in venting on foot the monasteries under his government, is to be ascribed an illness that terminated in his death, at Venice on 17th of Sept. 1582. Moreri.

**CONSTADT, or Konstadt**, in Geography, a small town of Prussia, situated in Lower Silezia, in the principality of Oeh.

**CONSTANCe, Costantcz, or Consteinitz, a considerable town of Wrtemberg, in the circle of Swabia, formerly a free imperial city, under the protection of Austria, delightfully situated at the north-western extremity of the lake of Constance, where the Rhine flows out of it again; or between the two lakes; 45 miles N.E. from Zurich. N. lat. 47° 40'. E. long. 9° 12'. The fort of Petershausen defends it on the left side of the Rhine. "I was much afflicted," says Mr. Coxe, who visited this place in 1776 (see Travels in Switzerland, vol. 1. p. 16.) "with the solitary appearance of a town once so flourishing in commerce, and so celebrated in the annals of history. A dead stillness reigns throughout; grass grows in the principal streets; in a word, it wears the melancholy aspect of being almost totally deserted, and secretly contains 3000 inhabitants. This city has endured a sad reverse of fortune; it was formerly in alliance with Zoric and Balle; and, supported by their affission, expelled the bishop, and embraced the reformation. But the Protestant cantons being worked in 1551; and the league of Smalcald, of which Constance was a member, being defeated by Charles V., the town was obliged to submit to the emperor;" (having been placed under the ban of the empire in the year 1548, for defeting the Roman Catholic religion), "and readmit the Catholic religion. From this period it lost its independence." In 1549 it was placed under the power of the house of Austria by Ferdinand I.; and though the estates of Swabia refused their assent, the subscription was ratified by the diet at Augsburg. Being neglected by the house of Austria, the town fell to decay. Constance once what revived, and afforded the prospect of becoming a commercial town, through the permission granted by the emperor Joseph, to the emigrants from Geneva, of settling and carrying on their trade and manufactures, with very considerable privileges; the principal of which were the following: viz. the right of purchasing or building houses; the free exercise of religion, entirely independent of the Catholic clergy; the power of erecting a tribunal for the purpose of deciding all affairs relative to their manufactures and commerce; exemption from serving in the militia and quartering soldiers, from all contributions during the space of 20 years, from duties on their tools and utensils; and the inevitable establishment of the standard of the gold and silver employed in their manufactures. "These favourable terms (says Mr. Coxe) signed on the 30th of June 1785, attracted to many fettlers to Constance, that in my second visit to this place, on the 25th of October 1757, the new colony of Genevans consisted of 70 families, comprising 350 persons; among these were 54 watch-makers, who had introduced the different branches of manufacture which belong to their trade. Four hundred watches were already finished, and above 1400 more were preparing. The emperor also has granted to Mr. Macaire the convent of Dominicans lately secularized, town, establishing a manufacture of coated linens and cloths. The refactory is appropriated for the chapel of the new colony. "This convent, which was once the asylum of monkish superlition, is now the seat of trade and industry; and it must suggest a pleasing reflection to a philosophic mind, that a successor of Sigismond, who violated his word," (as in the case of Hufs) "should have configned to a reformed establishment that very convent in which the Bohemian divines was imprisoned, and from which he was led to the stake; and that the most enlarged principles of toleration should be manifested in the same spot where persecution was inculcated by precept and example. It is the triumph of reason and religion over bigotry and intolerance." Since the period to which we have now referred, France has extended its revolutionary spirit and operations to the states of Switzerland; and time must develop their effects on the liberty and commerce, and consequent prosperity of the country. See *Helvetic Confederacy and Switzerland*. At present the manufactures and commerce of Constance are inconsiderable. Its celebrity is chiefly owing to a council held here from 1414 to 1418, which deposited three papas, viz. John XXIII., Gregory XII., and Benedict XIII., who had set up against each other; appointed Martin V. in their room, condemned the doctrine of Wickliff, and committed his works to the flames, in 1415; and caufed John Hufs and Jerome of Prague to be burnt, the former July 6, 1415, and the latter May 30, in 1416. At this council the assembled fathers on the 14th of June in 1415, passed the famous decree which took the cup from the laity in the celebration of the eucharist, ordered that the Lord's supper should be received by them only in one kind, i.e. the bread, and rigorously prohibited the communion in both kinds. The history of this council by L'Enfant is composied with great accuracy and elegance. A second edition of this work appeared at Amsterdam in the year 1728, in 2 vols. 4to.: the first was published in 1714. For an account of the treaty at Constance, A. D. 1183; see the article *City*.

**CONsTANCE, Lake of**, separates Switzerland from
that part of Germany hither called the circle of Swabia.

It is divided into three parts: the upper part, which is the broadest, is called Boden-See, the middle part Bodmer-See, and the lower part Zeller See.

The superior lake is about 15 leagues in length, and 6 in its greatest breadth. The borders consist of gently rising hills; on the left hand Swabia, and on the right Thurgau, with a variety of scattered towns, villages, and monasteries, and delightful villas, which afford several views to those who navigate the lake, that are truly enchanting. The form of the lake inclines to an oval, and the water is of a greenish hue. This lake, like all the other lakes of Switzerland, is considerably deeper in summer than in winter; a circumstance which is owing to the firm melting of the snow from the neighboring mountains. It abounds with all sorts of fish, and more particularly with the species of trout, called in its vicinity "Flank," and by Linnaeus *Salmo lacustris.*

A little above Stein, which is an independent town, under the protection of Zurzio; the Rhine widens considerably, and forms the inferior lake of Constance, or the Zeller-See, which is divided into two branches; from Stein to Constance is about 10 miles, and from the latter to Zell, its greatest breadth, about 10.

Near Merbourg the lake of Constance is fain to be 350 fathoms deep. This great depth is extremely advantageous to commerce, the lake being navigated by vessels of 100 tons and upwards. There are two islands in its middle, on one of which is the town of Lindau, formerly a free imperial city, but belonging now to the king of Bavaria, who, by the treaty of the confederation of the Rhine, has engaged to have it fortified and provided with artillery establishments. On the other island, about a mile in circumference, is the town of Meinau, which belonged to the knights of the Teutonic order, and whose situation is delightful.

The Rhine enters the lake of Constance at its south-eastern extremity, and issues out of it again at the north-west, not far from Stein. There is an ancient, and generally accredited tradition, that the Rhine, in crossing the lake in all its length, does not mix with its water. The fame is said of the Rhone, which runs through the lake of Geneva. Pliny the Elder, and Ammianus Marcellinus, are the authors of these fables. It is true that the two rivers are distinctly seen some time after their entrance into the lakes, but the difference of colour vanishes as soon as they have deposited the sand which they carry. Mr. Coxe, seated on a vessel on the lake, in vain attempted to distinguish the waters of the Rhine from those of the lake. The river, in its course from the superior lake, being exactly of the fame beautiful greenish colour as the inferior lake into which it flows; it is evident that the one can never be distinguished from the other. Probably, upon its first entrance into the superior lake it is troubled, and consequently, for some distance, its current may be easily traced; but it pursues itself by degrees, and becomes an indistinct part of the great body of water.

Of no better foundation is the report that the lake of Constance once froze. Wagner affirms that it was frozen in 1571 and 1596, when two inhabitants of Constance walked over the lake on the ice, measured it, and found it to be 7265 fathoms long, from Romizhorn to Bouchon, which is not its whole length.

**CONSTANCY, in a general sense, denotes immutability; but in ethics, or the philosophy of the human mind, the term implies resolution or steadiness, particularly under adverse trials and suffering. It was the saying of a heathen philosopher, that there cannot be imagined upon earth a spectacle more worthy of the regard of the creator, intent on his works, than a brave man superior to his sufferings. Nothing, indeed, can be more noble or honourable, than to imitate courage sufficient for executing the injunctions of reason and confidence; for maintaining the dignity of our nature, and the firmness which adheres to us; and for being so much unaffected by poverty, pain, and even death itself, as not to do anything that is reproachful or finful in order to avoid them. To imitate this temper, is to be great above title and fortune; and manifests a mind of heavenly extraction, and worthy of the offspring of the deity. Of this kind, many illustrious instances occur in history, and particularly in the history of the Christian church, and of the last moments of confessors and martyrs.**

**CONSTANS I., Flavius Julius, in Biography, third son of Constantine the Great, by Fausta, was born A.D. 320, and was created Caesar at six years of age. Upon the death of his father in 337, Constans succeeded to the sovereignty of Italy, Africa, and the western Illyricum, as his share of the empire. He had enjoyed his power but three years, when he was attacked by his brother Constantine, whom he defeated and slew.**

Constans, by this victory, became emperor of Gaul, Spain, and Britain; and in his turn, attacked the Franks, whom he humbled, and the Scots, which probably did not end much to his credit, as no notice is taken of the fact by his early biographers. Nevertheless, the prince was elated by the success of his arms, and assumed a degree of pride on the occasion, which would have ill become any man, and in him was rendered quite contemptible, owing to his want of talents and application. He was, moreover, a flave to his passions, and allowed himself in acts of voluptuousness, that drew down upon him the indignation of the people. Magnentius, an ambitious fable, encouraged by popular discontent, was resolved to avert the honour of the Roman name. A conspiracy was formed, and Marcellinus, count of the sacred laces, who had already supplied, with a liberal hand, the means of seduction, under pretence of celebrating his son's birthday, gave a splendid entertainment: the intemperance of the feast was artfully protracted till a late hour, and the unsuspecting guests were tempted to indulge themselves in a dangerous freedom of conversation. On a sudden, the doors were thrown open, and Magnentius, who had retired for a few moments, returned into the apartment invested with the diadem and purple. The conspirators instantly hailed him with the titles of Augustus and emperor. The guards immediately took the oath of fidelity, and ere the dawning of the day, Magnentius became master of the troops and treasure of the palace and city of Autun. Constans, who was pursuing his pleasure in an adjacent forest, being informed of the fact, threw off the imperial robes, and fled towards Spain; but before he could reach the sea-port, where he intended to embark, he was overtaken by a party of cavalry near Helena, at the foot of the Pyrenees, and put to death with a irong heart.**
been call headlong from the throne. Your majesty and wisdom have prevented the Roman state from degenerating into lawless tyranny. I therefore exhort and beseech you to stand forth as the counsellors and judges of the common safety." The senators were gratified by the respectful address of their sovereign; but Constanza was anxious to secure the crown that had suddenly devolved on him. He obliged his elder brother Theodosius to take holy orders, which rendered him incapable of civil government. The young emperor was not satisfied with this act, which was regarded as a profanation of the sacraments, but he caused Theodosius to be put to death. The act was scarcely perpetrated before the executions of his subjects, joined to the agonies of remorse, rendered life a burden. He could no longer bear to reside in the capital that had been the witness of a base and infamous fratricide. He became a voluntary and perpetual exile; and embarking for Grecia, displayed the hatred which he felt, and was conscious that he injured, by spitting against the walls of Constantinople as he left them. After passing the winter at Athens, he visited various parts of Italy, and concluded a pilgrimage of disgrace, by fixing his residence at Syracuse. Constantine easily fled from the imprecatory of an injured people, but he could not forget what he had done. The remorse of his conscience created a phantom that pursued him wherever he went: the image of his murdered brother was ever before his eyes, prefiguring to his lips a cup of blood, and saying, or seeming to say, "Drink, brother, drink!"—"a pure emblem," says the historian, "of the aggravation of his guilt, since he had received from the hands of the deacon, the mystic cup of the blood of Christ." Constantine, however, did not reign the cares of government. He took part in some wars carried on in Italy, and having been successful, entered the capital with great pomp, and was met by the pope and clergy at a distance from the city. In return for this mark of respect, he plundered Rome, and sent its wealth and ornaments to Constantinople. He then departed for Syracuse, where he resided five years, oppressing the people, and hated by those about him. Domestic treachery put an end to his life; he was assassinated while he was in the bath, in the year 668, after a miserable reign of 27 years. Gibbon, Univer. Hist.

**CONSTANT, DAVID**, was born at Lausanne, in Switzerland, in the year 1653, and became distinguished as a poetical divine, and professor of theology. He was indebted to his own country for the rudiments of useful knowledge, and was afterwards a student at Herborn in Germany, from which place he went to Groningen, Leyden, and Paris, for farther improvement. At Paris, he became acquainted with many very celebrated members of the reformed church, and having laid the foundation of solid learning, and formed a connection with several worthy characters, he returned to Switzerland in the year 1653, was ordained minister according to the Calvinistic form, and undertook the charge of a church at Copet. Here he cultivated a literary intimacy with Turretin, Tronchin, and other professors in the university of Geneva, and with Baille, the celebrated historian, but who at that time was tutor in the family of count de Donha, baron of Copet, the patron of David Constant. On a vacancy at the college of Lausanne, Constanza was appointed tutor to the first class, by the magistrates of Bern, and was afterwards elected professor of moral philosophy and the Greek language. The important duties of these stations he discharged with high honour to himself, and to the advantage of those placed under his instructions; his vacant hours were employed in editing some of the classics, original works. By his contemporaries he was much respected; they regarded him as a man of considerable literary acquirements, possessed of a fine judgment and a correct taste. In the year 1700, he was chosen professor of theology, a situation which he retained until he was eighty-nine years of age, when he resigned in favour of a successor, referring to himself, even then, the right of giving his advice and advice to the public in the most exalted degree. He died in 1733, having attained the venerable age of ninety-five. He published new editions of Eusebius; of Cicero’s smaller pieces, and of various other pieces adapted to the use of schools. His original writings were respectable; they were dissertations on various theological subjects. We have also "Styloma Ethico-theologicum," printed at Lausanne, 1695; a work "De Juramenti," and another "On Providence." — Moret. Constant quantity, in Geometry, that which remains the same, while others increase or decrease. Thus the semidiameter of a circle is a constant quantity; for while the absciss and semi-ordinates increase, it remains the same. Constant wind. See Wind.

**CONSTANTIA** in Ancient Geography, a town of Valeria, in the vicinity of the Danube. — Alfo, a town of Thrace, in the territory of Mount Rhodope. — Alfo, a town of Asia, in Mæopotamia; said by Ammianus Marcellinus to have been Amala, which was enlarged by the emperor Constantine, and adorned his name. — Alfo, a name given to Majumas, the port of Giza, after Constantine raised it to the rank of a town and gave it the name of his son. — Alfo, a name given to the town of Salamine. — Alfo, a name assigned by Constantine to the town of Arcata (Arles), according to Atanous, cited by Scaliger.

**CONSTANTIA GABRA**, a town of Gaul, in the second Lyconianus; now Courtance.

**CONSTANTIA, in Geography, a district of the Cape of Good Hope, a mile and a half from Alphen, close under the mountains, about midway between Table bay and False bay, consisting of two farms which produce the famous Cape or Constanitia wine, so remarkable for its peculiar rich flavour and sweetness. One of the farms where the white wine is made is called Little Constanitia; the other produces red. There are only from fifty to one hundred casks, of 154 gallons each, made annually of the genuine Constanitia wine. The grape is the muscadel, and the rich quality of the wine is owing partly to the situation and soil of the vineyards, and partly to the care taken in manufacturing the wine. No talk, and no fruit but such as is full ripe, are suffered to go under the press; precautions rarely taken by the other farmers of the Cape, who make annually about fix hundred 154-gallon casks of the common Cape wine, which, however, is frequently brought into the European markets, under the name of Constanitia wine. The muscadel grape grows at every farm; and at some farms in Drakenstein, the wine pressed from it is equally good, if not superior, to the Constanitia, though sold, on account of the name of the latter, at one fifth part of the price. This wine sells at the Cape for 50 or 80 rix-dollars for the half-case, which ought to contain 20 gallons; but the avaricious disposition of the proprietors, has led them to fabricate false cases, few of which come to England being found to measure more than 17 or 18 gallons, and many not above 16. When they find that the wine to be sent abroad, they adulterate it with some other wine. For, according to their own returns, the quantity exported and consumed in Cape Town, as in the case of Madeira wine, greatly exceeds the quantity manufactured.
The following table shows the quantity of Constantia wine exported in four successive years.

<table>
<thead>
<tr>
<th>Years</th>
<th>Half Aums</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1799</td>
<td>157</td>
<td>11,752</td>
</tr>
<tr>
<td>1800</td>
<td>158</td>
<td>14,070</td>
</tr>
<tr>
<td>1801</td>
<td>173</td>
<td>13,607</td>
</tr>
<tr>
<td>1802</td>
<td>213</td>
<td>15,745</td>
</tr>
<tr>
<td>In 4 years</td>
<td>728</td>
<td>54,574 R. D.</td>
</tr>
</tbody>
</table>


**CONSTANTINE**, or Constantine, the eastern province of the kingdom of Algiers, which see. This province, which is the largest and richest of the four provinces into which Algiers is commonly divided, (the three others being Mascara, the territory of the city of Algiers, and Titeri,) lies between the meridians of the rivers Boobarak and Zaine, which separates it from Tunis, and is bounded on the north by the Mediterranean, on the south by the Sahara, on the west by Blidgolger, and on the east, in its greatest extent, by the river Malva, or by the territory of Algiers, &c. It is nearly equal in extent to the two western and southern provinces, being, by Dr. Shaw's statement, 2,900 miles in length, and more than 100 in breadth; and far surpassing them in wealth and strength, as well as in the number and goodness of its cities. The tribute collected by the viceroy of this province, according to Dr. Shaw, is proportionably greater. For whilst the Titeri bey brings every year into the treasury of Algiers little more than 12,000 dollars, each being 32 and 42 or 62, and the Tlemcan bey from 40 to 50 thousand; the viceroy of Constantia never pays in less than 80, and sometimes 100 thousand. The sea-coast of this province, from the Boobarak to Boujjiah, and from thence almost entirely to Bona, is rocky and mountainous; and the whole tract which lies between the meridians of the rivers Boobarak and Zborre, from the sea-coast to the parallels of Sceef and Constantia, is, for the most part, a continued chain of exceedingly high mountains; few of whose inhabitants, from the ruggedness of their situation, pay any tribute to the Algerines. Near the parallels of Sceef and Constantia it is diversified with a beautiful inter-changing of hills and plains, which afterwards become less fit for tillage, till it terminates, upon the Saharan, in a long range of mountains, supposed by Dr. Shaw to be the Bazara of the ancients. The district of Zabib (which see) lies immediately under these mountains; and beyond Zabib, at a great distance in the Sahara, is Wadrey, another collection of villages. This part of the eastern province, including the parallel of Zabib, answers to the Mauritania Sitiffis, or the first Mauritania, as it was called in the middle age. The mountains are inhabited by free Arabian and Moorish tribes, which from time to time have proved formidable enemies to the power of Algiers. The most remarkable places are Boujjiah or Bugia, Culla, Bona, La Calle, the island of Tabarka, and Constantia; which see respectively.

**Constantina**, Constantina, formerly Cirta, is one of the most considerable cities of ancient Numidia, the capital of the above-deferred province, and the residence of the bey. Next to Algiers, it is the most populous city in the Algerine dominions. For a particular account of it, see Cirta.

**Constantina**, a town of Spain, in Andalusia; 50 miles S.W. of Cordova, and 42 N.E. of Seville.

**Constantina**, in Ancient Geography, a town of Phoenicia.—A so, a town of Alta, in Mesopotamia.

**CONSTANTINE I., Flavius Valerius Constantinus**, in Biography, the first Christian emperor, and transmitting the peace, was son of Constantius Chlorus by Helena. The situation to which this prince attained, has rendered posterity attentive to the most minute circumstances of his life and actions. The place of his birth, and the condition of his mother, have been subjects of warm, not to say violent, disputes. According to Mr. Gibbon, Helena was the daughter of an inn-keeper, and Naisius in Dacia was the birth place of her son, the subject of this article, about the year 274. In his youth he discovered little inclination to improve his mind by the acquisition of knowledge; but the combinaings of his figure, the dexterity which he exhibited in all manly exercises, and his known courage and affability, rendered him a favourite with the army and the people. He was about eighteen years of age when his father was promoted to the rank of Caesar; this event was attended with his mother's divorce, in order to make way for the second wife of Constantius, who could boast of an alliance with the imperial race. By this act the nobly-minded Constantine was reduced to a state of disgrace and humiliation. Indignant, probably, at the base conduct of his father, he remained in the service of Dioclesian, and signifying himself in the wars of Egypt and Persia, he was raised to the rank of tribune of the first order. The popularity of this young man rendered him an object of jealousy to Galerius, through whose interest he had already been denied the rank of Caesar. Endangered by the power and wiles of his opponent, and being kept for by Constantius, his father, whole health was daily declining, he secretly left Nicomedia, where he then was, and travelled with all expedition to Boulogne, and embarked with Constantius for Britain. The expedition was prosperous, and they easily obtained a victory over the Caledonians; but it was the last exploit of Constantine. He died at York, in the year 306, within little more than a year after he had received the title of Augustus. His death was immediately succeeded by the elevation of Constantine, who was proclaimed emperor by the army. The throne was the object of his ambition; and he knew too well the character of Galerius, the colleague of his late father, to hesitate as to the part he must take in this crisis. He was satisfied that if he wished to live, he must resolve to reign. At first he affected to refuse the choice of his people, and wrote a respectful letter to the emperor of the East, acquainting him with the event. The earliest emotions of Galerius were those of surprise, disappointment, and rage; he threatened to commit to the flames the letter, and him that brought it. Upon further deliberation, he resolved not to contest his succession to the sovereignty of the provinces beyond the Alps, but conferred on him the title of Caesar, referring that of Augustus to his favourite Severus. Constantine, who already possessed the substance, expected without impatience an opportunity of obtaining the honours, of supreme power; and accordingly employed himself some years in governing and securing the dominions fallen to his share. In defending his own rights, he was often betrayed into acts of cruelty, unworthy of a great mind. Contending with the Franks, he took two of their kings, whom he barbarously exposted to wild beasts in the amphitheatre of Trier: in some disturbances where he was victorious, he spared neither sex nor age; exhibiting a ferocity that freoms ill to accord with the general tenor of his character, to which he was probably
probably prompted by the supposition, that upon a bar-
barous foe all kinds of barbarity were allowable. In 307
he married Fausta, daughter of Maximian, who had re-
sumed the purple; but he took no part in the fortunes of
his father-in-law, who was ever engaged in warfare, till he
became himself Constatine's open enemy, and endeavoured
to drive him from his rightful authority. Under these cir-
stances he was delivered into the hands of his son-in-law,
who slew him at another favour than that of allowing him
the choice of the manner in which he would die: Maximian
strangled himself in the year 310.

Shortly after this event, which was little creditable to
the feelings of Constatine, or to the filial piety of Fausta,
who took no means to soften the resentment of her husband,
a civil war broke out. Maxentius, who had reigned in con-
junction with Constatine, now laid claim to the monarchy
of the whole West, and made preparations for an invasion of
Gaul. Constatine relying as well on his own talents, as on
the hatred borne to his rival, resolved to anticipate the attack,
and to carry the war into the heart of Italy. The armies of
Maxentius, amounted to one hundred and seventy thousand
foot, and eighteen thousand horse. The wealth of Italy
supplied the expenses of the war, and the adjacent provinces
were exhausted to form magazines of corn and other kinds of
provisions. The whole force of Constatine consisted of
ninety thousand foot, and eight thousand horse; a large part
of which was necessary to the defence of his other dominions.
At the head of forty thousand foot; he marched to en-
counter an enemy, whose numbers were at least four times
superior to his own. Constatine had been trained from his
earliest youth to war, to action, and to military command,
and his troops were in the highest state of discipline: these
he disposed with consummate skill, and for himself he chose
the point of honour and danger. Distinguished by the splen-
dor of his arms, he charged, in person, the cavalry of his rival,
and his irresistible attack determined the fortune of the day.
The victory was complete, and the dismayed followers of
Maxentius rushed by thousands into the Tyber. The em-
peror himself attempted to escape back into the city over
the Milvian bridge, but the crowds which pressed together
through that narrow passage, forced him into the river, where
he was immediately drowned by the weight of his armour.
His body which had sunk deep into the mud, was found the
next day; and the sight of his head, when it was exposed to
the eyes of the people, convinced them of their deliverance,
and led them to acknowledge as their sovereign Constatine,
who thus acquitted by his valor and high talents the most
splendid enterprise of his life. It was previous to this battle,
A.D. 312, that historians affign the date of Constatine's
conversion to Christianity, who had never before discovered
religious principles of any kind. A splendid miracle is men-
tioned as the immediate instrument of this change. Dr.
Lardner, indeed, offers some reasons why Constatine could
not well have remained through life without some religious
impressions; he is however willing to follow the account of
Eusebius, who says, that about the period of the war with
Maxentius, the emperor was led to consider that he had drawn
in need of more powerful assistance than military forces; he
therefore sought for a God that should be his helper. The his-
torians go on to say, that in part of his march, as the day was
decreasing, there appeared to the sight of Constatine, and to
that of all his army, a luminous cross above the sun, with the
inscription 

\[
\text{SALVAM} \text{nomen} \text{DOMINI} \text{EX} \text{VENETIS}.
\]

by this conquer; that the monarch not comprehending the meaning of this sign was further instructed, in the following night by a vision of Christ himself, bearing his cross, and directing him to take a similar standard, under
which he should march to victory. In the morning Con-

stantine communicated this wonderful circumstance to his
friends; and sending for ingenious workmen, he gave them a
description of the sign, and showed them how to make one like it
in gold and precious stones; which, says Eusebius, "we have
seen." Much has been said respecting this surprizing phe-
nomenon. By some the whole is regarded as a fiction, a fra-
tagem and political device of Constatine, yet it is related by
Eusebius a grave historian, who declares that he had it from
the emperor, who confirmed the narration by the narrators
elsewhere. By Fabricius, we are told, that the appearance in the heavens
was generally looked upon as a reality, and a miracle: but
for his own part, he is inclined to consider it as the result of
a natural phenomenon in a solar halo; he accordingly admits of the reality of the phenomenon, but does not suppose it to
be properly miraculous. Upon a full and candid review of
the evidence, Dr. Lardner, whom we have before quoted, and
than whom no one was a better judge of human testimony,
says inclined to doubt the relation given by the emperor,
upon whose sole credit the story is recorded, though it was
twenty years after the event, when Eusebius wrote his ac-
count, during which period he must have heard it frequently
from eye-witnesses, if the emperor's relation were accurate
that the appearance was visible to his whole army as well as to
himself. The oath of Constatine, on the occasion, with
Dr. Lardner, brings the fact into suspicion, and another
frightful circumstance is that Eusebius does not mention the
place where this wonderful fight appeared. Without, how-
ever, entering, at present, further into the discussion, which
we shall refer to the article Cross; we may observe, that
Eusebius has led us to the period, when the sign of the cross
began to be made use of by Constatine, among his armies,
and at his battles; this was probably the day before the last
battle with Maxentius, fought on the 27th of October, 312.
About this period, it is admitted, that Constatine became a
Christian, and continued to the remainder of his life, taking
care also to have his children educated in the same principles.
His conversion seems to have been partly owing to his own
reflection on the state of things, partly to conversation and
discourse with Christians, with whom, the son of Constatine,
their friend and favourer, must have been some time acquainted,
but perhaps, chiefly to the serious impressions of his early
years, which being once made can never be wholly obliterated.
Constatine was however a politician as well as a Christian,
and he probably hit upon this method to reconcile the minds
of his army, to the important change in their religious pro-
fection and habits, as well as making use of it as a mean of
favouring his designs against his enemies, for which purpose
he rightly judged, that the standard of the cross, and the
mark of it as a device on his soldier's shields, would be of no
small service.

We must now return to Constatine in the character of
a victorious general. After the battle, he entered the cap-
tal in triumph, wholly destroyed the family of his rival, but
refused to include among the victims, many whom the
Romans would gladly have sacrificed to their abhorrence of
the late tyranny. He disbanded and dispersed the pretorian
guards which had so often made and murdered emperors:
he recalled many who had been banished, and restored to
them their estates: he discouraged informers, and promoted
the welfare of the city. The senate immediately paid a
decrees, conferring on him the first rank among the three
Augusti, who then were masters of the world: Licinius
and Maximin were the other two. Africa readily followed
Italy in recognizing the sovereignty of the conqueror. To
Licinius, with whom he had an interview, he gave his sister
Constanitia in marriage, in order to strengthen his own
hands. From Milan, where the two emperors suffered an
edict under their joint authority, allowing a general toleration in religious matters within their dominions. Constantine was called by an attempt of the Franks to cross the Rhine. Once there he gained a complete victory, and made many prisoners, whom, as in former instances, he exposed to wild beasts. In the mean time a civil war arose between Maximin and Licinius, which terminated in the destruction of the former, and the expiration of his whole family.

Constantine and Licinius were now masters of the world, but they did not long continue united. A war broke out between them in the year 314, but the result of several battles was decided in favour of Constantine. Licinius sued for peace, which he obtained, and which continued eight years. In 323 another war was excited between the emperors. Licinius had long been hostile to the Christians, whose affection he had alienated, and who looked up to Constantine as their patron, and the head of their religion. Aware of this circumstance, and relying on his own superiority, as a military commander, Constantine began the quarrel. Under the banner of the cross, and accompanied by bishops and other ministers of their holy religion, he went out with 150,000 well-disciplined and well-armed soldiers to meet his rival, who waited his arrival in the vicinity of Adrianople. Constantine was again victorious: Licinius fled to Byzantium, and when he found that place no longer tenable against the power of his enemy, he withdrew to Chalcedon, and from thence, after hazarding another battle, in which he was also unsuccessful, to Nicomedia; where, by the intercession of his wife, he obtained a solemn promise of having his life spared, on the condition of his renouncing all claims to sovereignty. To the disgrace of Constantine imprisonment and death soon followed the humiliation of his rival. This deed has been justified on the plea that the fallen emperor had engaged in a treasonable correspondence against the reigning sovereign, but sufficient evidence of the fact was not added. The son of Licinius was also sacrificed to the jealousy of Constantine, who, by these atrocious means, delivered himself from all dread of opposition. An arbitrary prince seldom finds any difficulty in freeing himself from his enemies, but Constantine with all his powers, could neither foresee, nor prevent, those domestic calamities to which he shortly became the prey. Cripus, his son, by a former wife, was viewed, by his mother-in-law Fausta, as the chief obstacle to the future greatness of her own children. She introduced into the breach of Constantine suspicions of his son’s loyalty, and is said also to have brought a charge against him of having attempted her own chity. Cripus was examined, imprisoned, and put to death in the year 326. His grandmother Helena, convinced of his innocence, resolved to be revenged for his hard fate, and found means of convicting the empress of an adulterous connection with a flave of the palace, for which she was suffocated in the gream of a hot bath. From these circumstances, and from the contempt which he shewed for the pagan rites, the emperor became unpopular with the people and the senate. On his part there was no personal attachment to the ancient metropolis, and he was resolved to perpetuate his name by the foundation of a new city. After much deliberation he fixed on Byzantium, which he had once belied, as the imperial city that should, with future ages, give him celebrity and renown. See Constantinople.

In the year 331 Constantine was involved in a war with the Goths, who at first were successful against his power, but were, at length, defeated and compelled to agree on such terms as the victor thought proper to propose. Constantine, by challenging the pride of the Goth, and by accepting the homage of a suppliant nation, vindicated the majesty of the Roman empire; and ambassadors from Ethiopia, Persia, and the most remote countries of India, came to congratulate him on the peace and prosperity of his government; and he seems to have enjoyed an uninterrupted share of felicity, as a man situated as he was could reasonably expect. He attained to the thirteenth year of his reign, a period which none of his predecessors, since Augustus, had been permitted to celebrate. Constantine survived that solemn festival about ten months, and, at the age of sixty-four, after a short illness, he ended his memorable life at a palace in the suburbs of Nicomedia, whether he had retired for the benefit of the air, and with the hope of recruiting his exhausted strength by the use of the warm bath. The demonstrations of grief, or at least of mourning, purported whatever had been practised in any former occasion. The body of the deceased emperor was transported to the city which was destined to preserve the same and memory of its founder: there it was adorned with the symbols of greatness, and deposited on a golden bed in one of the apartments of the palace, which was splendidly illuminated and furnished for the purpose. Every day, at the appointed hours, the officers of state, approaching the porch of their sovereign, offered the same respectful homage to his dead body as they had been accustomed to present to him during his life, so that it has been said Constantine-alone, by the peculiar indulgence of heaven, reigned after his death.

It remains now to give a general estimate of the character of this great man, who was unquestionably the most splendid among the Roman emperors. It is no wonder that a prince who removed the seat of empire, and introduced such important changes into the civil and religious constitution of his country, should have fixed the attention, and divided the opinions of mankind. By certain classes of Christians he has been regarded as the deliverer and defender of the church, and has been decorated with every attribute of a hero, and even of a saint; by others, he has been considered as the real, though without any ill intentions on his part, enemy to the cause of true Christianity, by incorporating it with the civil government of the world: by contemporary historians who did not embrace the religion of Christ, Constantine was compared to the most abhorred of those tyrants, who, by their vices and weaknesses, dishonoured the imperial purple.

Constantine was, in person, remarkably tall, of a comely and majestic presence, and great bodily strength. The general tenor of his life proves that he was a prince of no mean capacity: the achievements and success of Constantine do not belong to men of weak and irreligious minds. His mind indeed was equal to his fortune, great as it was: his valour was tried and approved frequently in his youth, and was conspicuous on all proper occasions throughout his whole life: his chality, justice, and prudence, are commended by those of his biographers, who, on account of a difference in religion, were not disposed to flatter him: his many acts of bounty to the poor, and his just edicts are arguments of a merciful disposition, and a love of justice. According to Eusebius the palace of Constantine was converted into a church; and the emperor himself cheerfully led the way to those that assembled there with him. Taking the sacred books into his own hands, he attentively read and meditated upon the divine oracles; and then recited the usual prayers with those who were met together. Constantine besides prayed daily in private in his chamber. In time of war he had a chapel at a small distance from his camp for the performance of religious duties, especially before battle, seeking thereby the divine protection and blessing. He taught
taught even his heathen soldiery a form of prayer, in which they worshipped the one true God. Thence and many other influences of the Christian temper are ascribed to the emperor by Eusebius. By our own historian, the early part of his life is highly panegyrized: "He delighted," says Mr. Gibbon, "in the social intercourse of familiar conversation; and though he might sometimes indulge his disposition to rillery with less reserve than was required by the severe dignity of his station, the courtesy and liberality of his manners gained the hearts of all who approached him. The disadvantage of an illiterate education had not prevented him from forming a just estimate of the value of learning; and the arts and sciences derived some encouragement from the munificent protection of Constantine. In the dispatch of business, his diligence was indefatigable; and the acts of his mind were almost continually exercised in reading, writing, or meditating: in giving audience to ambassadors, and in examining the complaints of his subjects. Even those who confounded the propriety of his measures were compelled to acknowledge, that he poissfed magnanimity to conceive, and patience to execute, the most arduous designs, without being checked either by the prejudices of education, or by the clamours of the multitude. In the field, he invigorated his own intrepid spirit into the troops, whom he conducted with the talents of a consummate general; and to his abilities, rather than to his fortune, we may ascribe the signal victories which he obtained over the foreign and domestic foes of the republic. He loved glory, as the reward, perhaps as the motive, of his labours. The boundless ambition, which, from the moment of his accepting the purple at York, appears as the ruling passion of his soul, may be justified by the dangers of his own situation, by the character of his rivals, by the consciousness of superior merit, and by the prospect that his success would enable him to restore peace and order to the distracted empire." As he advanced in life, his character was less respectable, his actions less honourable. The ostentatious grandeur of his court, and his magnificent buildings, were supported by taxes which bore very heavily on the people, and in his old age he was charged with prodigality and rapacity. Eutropius says, that Constantine, "in the early parts of his reign, might be compared to the belles princes, in its conclusion to the indifferent ones." And Dr. Lardner, who took great pains to understand and appreciate the worth of this emperor, observes, with his usual candour, that "we should be willing to make allowances in favour of princes, and especially of long reigns. It is next to impossible for human wisdom and discretion, in the course of many years filled with action, not to be surprised into some injustice, through the bias of affection, or the specious suggestions of artful and designing people. Though, therefore, there may have been some transgressions in this reign which cannot be easily justified, and others that must be condemned, yet we are not to consider Constantine as a cruel prince or a bad man." Gibbon. Lardner. Jortin. Univer. Hill.

CONSTANTINE II., the eldest of the three sons of Constantine the Great, was born in the year 316, and, by the indulgence of his father, was admitted at a very tender age to share the administration of the empire. He and his brothers may be said to have studied the art of reigning at the expense of the people entrusted to their care. During his father's lifetime, the younger Constantiiæ was appointed to hold his court in Gaul: and upon his death in 377, he succeeded to the government of Gaul, Spain, and Britain; to him also was assigned the city of Constantinople, with a certain superintendence of rank above his brothers. During his short reign, he did little that has been deemed worthy of historical record. Dissatisfied with the share of empire allotted to him, he was driven to poise the provinces of Africa, which had been given to Constatine the Great; his solicitations were in vain: determining, therefore, to wail by force, what he could not obtain by argument, at the head of a tumultuary band, he invaded the dominions of Conslans, and laid waste many parts of the country. The measures of his brother were directed with more prudence; and Conslanctine, by too great eagerness, was betrayed into an ambuscade, which had been concealed in a wood, where he and his attendants were surrounded and slain, A.D. 342. His body was afterwards found in the obscure forest of Alis, and obtained a place in the imperial sepulchre; but his provinces transferred their allegiance to the conqueror. Contemporary historians speak of Constantine as a prince of great accomplishments; but his conduct towards his brother met with a punishment which neither merited nor obtained the pity of survivors.

CONSTANTINE III., the next emperor of this name, was the son of Heraclius by Eudoxia, and succeeded his father in 641. Of him more cannot be well said than that he reigned three months, and died in his 30th year, either by disease, or by poison, supposéd to have been administered by his mother-in-law.

CONSTANTINE IV. succeeded his father, Conslans II., in the year 665. Very soon after he came to the throne, he went to Sicily, with a view of punishing his father's murderers, and to depose the usurper whom they had established. His enterprise was successful; but upon his return to Constantinople, he was scarcely recognized, on account of the alteration in his beard; hence he obtained the appellation of the bearded. In this reign the Saracens invaded Africa, Sicily, and Cilicia, and at length laid siege to Constantia. Their attempts were completely baffled, and their losses in men was very considerable. The emperor, however, became tributary to the Bulgarians, who successfully invaded some of his territories. This prince, who died in the year 685, appears to have poissed a small share of talent, intermixed with cunning and cruelty. On his two brothers he had bestowed the empty title of Augustus, unconnected with truth or power. At their secret instigation, the troops of the Anatolian province approached the city on the Asiatic side, demanding for their royal brothers the partition or excretion of sovereignty, and supported their claims by a theological argument. "We are Christians," they said, "the sincere votaries of the holy and undivided Trinity; since there are three equal persons in heaven, there should be three equal persons on earth." The emperor invited them to a friendly conference, in which they might propose their arguments to the senate: they obeyed the summons; but the view of their bodies, hanging on the gibbet in the suburb of Galaten, reconciled their companions to the unity of the reign of Constantine. He pardoned his brothers; but on the repetition or suspension of a similar offence, the obnoxious princes were deprived of their titles and places, that the deformity might disqualify them from the empire. In the close of life, Constantine was anxious to establish the right of primogeniture; and the eldest son was exalted to the rank of Augustus, and the assurance of the empire.

CONSTANTINE V., son of the emperor Leo, was born in 719, and crowned in his infancy. He was consecrated Co-emp of his reign, from having polluted the baptismal font. During a long reign of 54 years, he ever exhibited an adherence of image-worship, which rendered him an object of hatred to the catholics, who had used every means in their power to tranquillize his name to pollute in the most disgraceful light.
light. Although he did not merit all the opprobria affixed to his character by ecclesiastical bigots, yet he undoubtedly exercised much cruelty towards the party which resisted his attempts for reform in the church. Some were put to death, others mutilated, and not a few underwent less severe punishments. As a general, he exhibited much prudence and courage. Soon after his accession he marched against the Saracens, who had made an irruption into Asia; and his brother-in-law, taking advantage of his absence, placed himself at the head of the orthodox faction, and was declared emperor. A civil war ensued, in which Constantine was victorious: the metropolis surrendered to its lawful sovereign, and the usurper and his son were deprived of their ill-gotten power, and of their eyes. When every thing at home was settled to his satisfaction, he made war again upon the Saracens, took their strong places, and destroyed their fleet. In the midst of his successes, a earthquake, and a pestilence among his own people, were calamities which excited in him the greatest consternation. After this he was attacked by the Bulgarians, by whom he was so completely defeated, that he was obliged to seek refuge in his capital: but in another attack, victory determined for Constantine, who cut off the invaders, with scarcely any loss. As he was proceeding on a new expedition against the same people, he was seized with a fever, which terminated his life in 775.

To the praise of this prince, his enemies admit that he restored the ancient aqueduct, a work of great importance to the inhabitants of Constantinople. He redeemed nearly three thousand captives: and under his reign, plenty was the characteristic of the times. Moreri. Gibbon. Univer. Hist.

Constantine VI., grandson of the preceding, was born in 770; and when only five years of age, he was associated with his father, Leo IV., in the government: but neither then, nor in 780, when he succeeded entirely to the throne, was he capable of efficient business. His mother Irene was appointed guardian to the young emperor; she, naturally ambitious, and impatient of control, was unwilling to resign the power over her own hands. The contests between the mother and her son were the most prominent features of this reign. During the childhood years of the emperor, nothing could be better administered than the government under Irene: but when he had attained the years of maturity, by the advice of his adherents, he would fain have rewarded his mother's services by perpetual banishment to the Isle of Sicily. Irene was too politic to be thus served: she retaliated upon her enemies, and obtained for herself almost an unlimited obedience. Her abuse of victory proved detrimental to her interests: Constantine ascended the throne sole sovereign, and his mother was dismissed to a life of solitude, to the enjoyment of which her mind was by no means adapted. She was recalled to court, and soon obtained a certain degree of authority. The emperor was attacked and defeated by the Bulgarians; and sullying an incursion in favour of Nicephorus, son of Constantine V. by a second marriage, he had him seized and his eyes put out, and the tongues of his four brothers were amputated. After this cruel punishment, they were doomed to perpetual imprisonment. Irene having submitted to their fate: an opportunity then offered, and they made their escape to the church of St. Sophia, displaying a pathetic spectacle to the people. "Countriesmen and Christians," exclaimed Nicephorus for himself and mute brethren, "behold the sons of your emperor, if you can recognize our features in this miserable state. A life, an imperfect life, is all that is spared: this is now threatened, and we appeal to your compassion." Their wretchedness affected the people, but the minislers of Constantine contrived to soothe their miseries, and draw them from public view. They were speedily embarked for Greece, and Athens allotted to them as a place of exile. Once more they escaped from the hands of their keepers, and appeared in parade at the gates of Constantinople. This was their last effort: in attempting to gain a crown, they lost their lives. Irene soon found an opportunity of exciting dissentions, with a view of depopulating her son. Suspecting his danger, he attempted to escape to the provinces, but was caught on the Asiatic shores, and carried prisoner to his own palace, where, in the very chamber in which he was born, the emblems of his unnatural and infamous mother affrighted him in his sleep, and plunged their daggers in his eyes. In this state he survived many years, to reflect on his own cruelty, and to learn the urgings of Irene.

Constantine VII. was son of the emperor Leo VI., and nephew to Alexander, whom he succeeded in 912, being but seven years of age. During his minority, Romanus Lecapenus, a successful general, got possession of the emperor's person, and prevailed on him to marry his daughter. He then assumed the royal purple himself, and associated his own three sons in the imperial authority, degrading the lawful emperor to the fifth rank among the titular princes. Much, however, to the honour of Romanus, he permitted him to live unmolested; and the time of Constantine was spent in the study and practice of the fine arts. The fall of Romanus was occasioned by the ambition of his own children, who effected the banishment of their father, and, contrary to their own expectations, elevated Constantine to his rightful throne. To prevent their future intrigues, the emperor's first act was to seize the conspirators, and banish them to the same island and monastery in which they had so lately confined their father. Romanus met them on the beach with a farcical smile, and, after a jilt reproach of their folly, ingratitude, and weakness, presented his imperial colleagues with an equal share of his water and edible diet. Constantine was now in possession of the eastern world, which he governed, or appeared to govern, fifteen years. He was, however, devoid of that energy of character which became the sovereign of so mighty an empire. The studies which had amused his life of comparative solitude, were not easily exchanged for the serious and important duties of a monarch. The reins of government he entrusted to his wife Helena, while he employed much of his time in the instruction of his son Romanus, and in drawing up a treatise for his immediate benefit, but of which he made folly a use, that he is suspected of having administered poison to his father, in order to succeed him in the empire. The death of Constantine was regretted by his subjects, who paid every demonstration of regret to his decafed corpse, which, according to usual custom, lay in state at the palace. Before the procession moved to the sepulchre, an herald proclaimed the awful admonition: "Arise, O king of the world, and obey the summons of the King of kings."—One of the deposed sons of Romanus had, during his short-lived authority, assumed the title of Constantine VIII.; of him therefore enough has been said; and we proceed to the reign of Constantine IX., who, in conjunction with his brother, Basil II., succeeded to the throne, on the death of John Zimricus, in the year 976. During the long life of Basil, Constantine had only the name of emperor: all emanated from his brother. After his decease, Constantine enjoyed, about three years, the power, or rather the pleasures, of royalty; and his chief care was the settlement of the succession. He had possessed sixty-five years, the title of Augustus; and the reign of the two brothers is the longest.
lager and most obscure of the Byzantine history. He ended his inglorious life in 1028, at the age of seventy.

Constantine X. was surmounted by Monomachus, the single combatant, which was probably expressive of his valour and victory in some public or private quarrel. He was a Greek noble extraction, and recalled from exile in Lesbos to succeed Michael V. He was at that time married to Zoe, the daughter of Constantine IX. With her, who had already been wife to two emperors, he was disdained, and took, as consuaine, a widow, to whom he gave the title of Augusta. This reign was disturbed by various revolts, in which the emperor was usually victorious. He was successful also against his foreign enemies; but his insolvency or avarice gave the Turks an opportunity of gaining a footing in Asia Minor. He died in 1054. The health of this emperor had, during the greater part of his life, been broken by the tortures of the gout, and his reign was spent in thealternatives of sickness and pleasure.

Constantine XI. surmounted Doucas, who was chosen by the emperor Isaac Comnenus, as the atteinder to succeed him, when he voluntarily laid down the crown in 1059. The beginning of his reign was affected by a conspiracy of his own people against him. Having quelled this, he began to turn his attention to government, for which he seems to have been very unequal. By the principles of avarice, he neglected the maintenance of his garrisons on the frontiers, and the Xians, a people of Scythia, taking advantage of this circumstance, paffed the Danube, and laid waste the country. They penetrated into Greece, and defeated the imperial generals, who had been sent against them. Constantine would have gladly purchased peace, on any terms; they, however, disdained to treat, and were finally flogged in their victorious career, by peltence, and the arms of the Bulgarians, circumstances which destroyed the greater part of the number, that in the outfl amounted to nearly half a million of souls. During this reign an earthquake did much damage to the empire. Constantine died at the age of 63 years, having previously secured the succession of his three sons. Of thefe one assumed the title of Constantine XII; but his glory was merely nominal, and lost in that of his elder brother Michael. Of the eleventh Constantine, historians say he was an orthodox and just prince, but the slave of avarice. The XIIIth prince of this name was son of the emperor Manuel Palaeologus, and succeeded his brother John in 1448, at a period when the whole empire scarcely extended beyond the limits of the capital. This sovereign having squandered the small remaining resources of his dominion in imperial ostentation, found himself threatened with the hostility of his potent neighbours, sultan Mahomet II., who erected a fortress on the Bosphorus, found occasion for a quarrel, and laid siege to the capital. Constantine determined to refit to the ball, and to share the fate of his people. He fought for succour among the Chilian princes of the West, but the aid he obtained was tardy, and insufficient to the great forces of the occasion. Constantinople was encompassed by Turkish arms, and the emperor, in this extremity, fulfilled the part of a hero. When the final assault was prepared, he took leave of his people in a moving harangue, received the sacrament in the church of St. Sophia, and then went to the walls. The numbers of the Turks without, exceeded those of the Christians within, the city, more than a hundred fold. Every hope of successful resistance was vanished; breaches had been made in the walls, and at length they and the towers were covered with flames of the assailants. Amidst these multitudes, the emperor, who nobly accomplished all the duties of a general, and lordly, was long seen, and finally lost; his mournful exclamation was heard, "Can there be found a Christian to cut off my head?" His last fear was that of falling alive into the hands of the infidels. He had thrown off the purple, and falling by an unknown hand, was buried under a mount of flour. The final catastrophe of the Greek empire, and emperor, happened May 29th, 1453, Constantinople having sustained a siege of 53 days. See Constantine XI. Morev. Gibbon. Univer. Hist.

Constantine, Flavius Julius, from a private soldier, in the legions of Britain, was raised to imperial honours, on account of his name, and in respect for the great Constantine. He had no sooner attained the high honour, than he passed over to Gaul with his troops, and made himself master of that country. With the assistance of his son Constans, he reduced Spain; and upon Comlans he conferred the title of Augustus. Constantin fixed his throne at Arles, and when the Goths under Alaric had taken pollution of Italy, he marched as far as the Po, on the pretence of effecting its deliverance, but probably with a view of sharing in the spoil. After passing through various scenes, in which he experienced by turns success and disaster, Constantine was befreed in his capital by Comlans, to whom he removed, on the promise of security for himself and his son. The terms were granted, but the engagement was not fulfilled. The fallen prince was sent to Italy, where he and his son Julian, in violation of a solemn promise, suffered death by the emperor's orders, Sept. the 18th, 411. Morev. Gibbon.

Constantine: there were two popes of this name: the one a native of Syria, raised to the Roman see in 708, characterized for his charity to the poor; and for his ambition, in engaging Julian to subjugate the independent see of Ravenna to the yoke of Rome; the other, from a laistan, was raised to the highest office in the church by the influence of his brother; an honour, however, that he did not long retain. An infurrection being excited against him, in the sixth year after his elevation, he was deposed, and, under the reign of the new pope, was subject to the insults and most cruel treatment of the people, deprived of his sight, and condemned to perpetual imprisonment. Morev.

Constantine is the name likewise of an abbot who flourished at Metz in the eleventh century, and who was author of "The Life of Adalbert II. bishop of that city: and of a monk distinguished for his writings in the thirteenth century, against Vecius, patriarch of Constantinople. Another of the same name was born at Florence, and became bishop of Orvieto. He acquired celebrity by his preaching talents, and after his elevation to the bishopric, he was appointed legate from pope Alexander IV. to Theodore Lalevis, the Grecian emperor, inquiring, by his perusals, to induce the emperor and his clergy to submit to the Roman see. He was author of the siege of St. Dominic, and other works. He died in the year 1257.

Constantine, surmounted the African, was born at Carthage, about the middle of the eleventh century. He reigned many years in Babylon, where he became celebrated for his knowledge in the Arabic, Chaldaic, Persian, and Egyptian languages. Among the sciences, medicine seems to have received the greatest share of his attention, as appears by two of his works, which were thought deserving of being printed several centuries after his death. In the first, which was published at Bale, in the year 1536, in folio, "De morborum cognitione, et curacione," he treats of affections of the stomach, hypochondria, and the diseases of women, &c. In the second, which was also published at Bale, three years after the former, he treats of fevers, of the elephasallia, of incantations, and of remedies taken
taken from parts of animals. The whole are however sup-
posed to have been principally translated from Arabic
writers.

After a residence of thirty nine years at Babylon,
he returned to Carthage, but soon fell into such disgrace
with his countrymen, whom he suspected of intending to
destroy him, that he went to Sardes. Though he was
there introduced to duke Robert, who wished to retain him
about his person, preferring a life of ease and retire-
ment, he entered into a monastery of the Benedictines, St. Agatha,
in Avera, where he died in 1087. Haller Bib. Med. Eloy
Dict. Hist.

CONSTANTINE, Robert, a native of Caen in Normandy,
was born, as it is said, about the year 1053. He was pro-
foundly versed in Greek, Latin, and oriental literature.
This procured him the intimacy of J. Caesar Scaliger (with
whom he resided several years), and of other great scholars,
but did not defend him against the facetiae of Joseph Scal-
ger, who attacked him with great ferocity. He took his de-
gree of doctor in medicine, but from the many learned works
he published, does not seem to have dedicated much of his
time to the practice of that art. His editions, with annota-
tions, of the works of Theophrastus, Dioscorides, Celsius,
and Quintus Serenus, gained him much credit. They were
published between the years 1554 and 1566, as was also
his "Nomenclator inquinum Scriptorum, quorum libri ex-
tant vel manuscripti, vel imprimunt," 1606. But the work
which established his name as a scholar, was his "Lexicon
Greco-Latinum," first published at Geneva, in 1572, in
two volumes folio, reprinted, much improved, in 1592. He
is said by De Thou to have lived to the great age of 103
years, preferring his faculties entire to the last. Other writers
say he died a centurion at the age of 75 years. Haller

CONSTANTINE, Antony, an eminent physician at Lyons,
published in 1597, in 8vo. "Brief traité de la Pharmacie
Provençale, et familière," in which he attempted to fowm
his countrymen, that they may find in their fields remedies
for their diseases, without having recourse to drugs imported
from foreign countries. Also "Opus Medico prophylac-
ico qui omnium symptomaticorum caufae et eventus expunctorat.
" 8vo. 1613. He died, far advanced in years, in 1616. Eloy
Dict. Hist.

CONSTANTINE, Order of, in Heraldy, otherwise the
order of the Golden Angel and St. George. Constan-
tine the Great is by some considered as the founder of this
order, after his memorable victory over the tyrant Max-
entius, A. C. 312. This is at present the second order of
the kingdom of Naples. Others affirm that the emperor
Iacus Angelus Commensus was the founder of it. The badge
of the order is a red cross, somewhat in the form of four
flares dehisced at the extremities, surrounded with a
border of gold, the entire embroidered the four letters I. H.
S. V., meaning, "In hoc signo vinces," being the words
displayed on the celestial meteor, or luminous cross, which
is said to have appeared to Constantine, and encouraged him
to attack Maxentius. In the badge of the cross is a
monogram, or cypher of our Saviour's name, expressed by
the letters X and P, and on each side are placed one of the
letters A and Ω (alpha and omega, or the fi and the laff
letters of the Greek alphabet.

The great collar of this order, worn over the mantle,
consists of fifteen enameled golden shields of an oval form,
and on each the letters X and P appear in the form of a
cypher. The middle shield is somewhat larger than the others,
and is surrounded with oak and laurel leaves entwined; and
from the lower part of it is suspended the effigy of St.

George, in complete armour, on horseback, and in the act
of slaying the dragon.

The council of this order is composed of 55 senators, who
are grand crossmen. When the grand master affixes in flate
therein, his device is as follows: the veil and small cloths
are of crimson velvet, embroidered with silver; above
the veil is worn a crook of silver, richly embroidered, with
wide sleeves, and reaching to the knees, festooned round
the waist with a girdle of scarlet velvet, embroidered with silver,
and about the neck with two rich cords of gold and scarlet
flok mixed, with tassels reaching to the ground. On the
left side of the mantle, the cross of the order is richly em-
brodered in gold. The cap is of crimson velvet, and on each
the cypher of our Saviour, as above described.

The grand crosses (in number 50) wear a blue veil and
small cloths, and over the same a white veil, which reaches
to the knees; their stockings and shoes are white; their
stuhl red, and their mantle of blue damask is lined with
white; they wear the great collar of the order, and their
cap, which is of blue satin, is turned up at the four fides,
and on each the cypher as before: the cap is also adorned
with a white ostrich feather.

The popes had conferred the grand mastership on the
house of Commenors for ever; but in 1669 Angelus Flavus
Commensus, the last of this house, resigned it to Francis
Fanalio, the then duke of Parma, to him and his successors
for ever; which was confirmed by a brief of pope Inno-
cent XII. dated 29th October, 1669. In 1725 the ducal
house of Farnese becoming extinct in the male line by the
death of Anthony the last duke, Don Carlos, the eldest
son of Philip V. king of Spain, and of Elizabeth Farnese, the
sole heiress of the family, succeeded to the dukedoms of Parma
and Placentia, and to the grand mastership of this order.
This prince was successively grand duke of Tuscany, and
king of Naples: upon his succession to the latter he declared
this order royal, and annexed it to the crown of Naples.

CONSTANTINOPLE, in Geography, the metropolis of
the Turkish empire, was built on the site and ruins of the an-
tique Byzantium in Thrace, by the Roman emperor Constan-
tine the Great, who, in the year of our Lord 330, removed
the seat of the empire from Rome to this new capital. The
reasons which induced Constantine to fix his residence here,
are not exactly known. The imperial court had in fact
been removed from Rome about thirty years before. Of
the subordinate emperors Diocletian and Maximian, the latter
removed from Nicomedia, and the latter mostly at Milan.
Ga-terius had his court at Nicea; Constanderius Chlorus at
York. It is supposed that Diocletian and Maximian, hav-
ing concerted a plan of admiration more systematically
depositive than that of any of the preceding emperors, and
being disposed of setting entirely aside the nominal authority
which the senate still possessed, had fixed their residence at a
distance from the ancient metropolis of the empire, in or-
der to avoid the republican remonstrances of that august
body. Constantine was probably actuated by the same
motive, for his administration was still more depopitive;
and after he had removed the seat of empire to Constantinople,
the senate could fearlessly be reckoned a conigrated order
in the state. Others attribute Constantine's choice of a
new capital to a dislike which he had conceived against
Rome, on account of the enthusiastic attachment of that
city to paganism. But whatever may have been Constan-
tine's motive, it cannot be denied that the situation of Con-
stantinople actually was preferable to that of Rome, both as
a check
CONSTANTINOPLE.

a check to the Persians, and as a barrier against the Goths, those terrible enemies of Rome, who, having once tasted the rich plunder of Greece and Asia Minor, seized every opportunity of making predatory incursions into all parts of the empire. Between the beautiful and picturesque arrangement of the land and water in the environs of Constantinople decided it to be preferred to Rome. It is situated on an elevated ground, consisting of gently swelling eminences, rising like terraces, one above another, without any of those deep valleys which separate the seven hills on which Rome is seated, and which, together with the marshes adjoining the Tyber, render the air unhealthy. It fills a triangle formed by the harbour, the Bosphorus and the Propontis, or sea of Marmora. Situated in the 41st degree of latitude, the imperial city commanded, from her seven hills, the opposite shores of Europe and Asia; the climate was healthy and temperate, and the soil fertile, and the approach on the side of the continent was small in extent, and easy of defence. The harbour on the north side is secure and spacious; it is five hundred yards wide at its entrance from the Bosphorus, and runs seven miles into the land. The Bosphorus and the Hellepont may be considered as the two gates of Constantinople; and the prince who possessed those important passages could always flout them against a naval enemy, and open them to the fleets of commerce when those gates were shut. The capital still enjoyed within their spacious enclosure every production which could supply the wants, or gratify the luxury, of its numerous inhabitants. In failing up the Propontis towards Constantinople the most enchanting prospects charm the eye of the navigator; from every part of that sea he may discover the high lands of either Thrace or Bithynia, and never leaves sight of Mount Olympus, till at last the city itself, rising from the Strand, attracts his view, and exhibits the most magnificent appearance. Constantinople also commands the commerce of the vast regions of the north, by means of the Euxine sea, and of the rivers Don and Dnieper, which discharge themselves into it. By the Strait of the Hellepont, which forms the communication between the Propontis and the Mediterranean sea, it is equally well situated for the trade of the south and west; and when Egypt is under its dominion its position is extremely advantageous with respect to the trade to India, and the eastern coasts of Africa.

Whatever rude commodities were collected in the forests of Germany and Scythia, as far as the sources of the Tanais and Borylhenes; whatever was manufactured by the skill of Europe or Asia; the corn of Egypt, and the gems and fábres of the farthest India, were brought by the varying winds into the ports of Constantinople, which for many ages attracted the commerce of the ancient world.

The prospect of beauty, of safety, and of wealth, united in a single spot, was sufficient to justify the choice of Constantinople. As prodigy and fable have, in every age, been supposed to reflect a becoming majesty on the origin of great cities, the emperor thought proper to avail himself of this circumstance; and in one of his laws he has taken care to inform posterity, that in obedience to the commands of God, he laid the everlasting foundation of Constantinople. The ingenuity of succeeding writers has led them to describe the nocturnal vision which appeared to the fancy of Constantinople as he slept within the walls of Byzantium. The tutelar genius of the city, a venerable matron, linking under the weight of years and infirmities, was suddenly transformed into a blooming maid, whom his own hands adorned with all the symbols of imperial great-

nefs. The monarch awoke, interpreted the auspicious omen, and, without hesitation, obeyed the will of heaven. In order deeply to impress the minds of the spectators, the emperor himself, on foot, with a lance in his hand, led the solemn procession, and directed the line, which was traced as the boundary of the defined capital, till the growing circumference was observed with allusion by the inhabitants, who, at length, ventured to observe that he had already exceeded the most ample measure of a great city. "I shall fill advance," replied Constantine, "till His, the invisible guide who marches before me, thinks proper to stop." In surveying the actual flate of the city, the palace and gardens of the fagade occupy the eastern promontory, the first of the seven hills, and cover about 150 acres of our measure. The new walls of Constantinople stretched from the port to the Propontis across the enlarged breadth of the triangle, at the distance of fifteen fladins from the ancient fortification; and with the city of Byzantium they enclosed fire of the seven hills, which, to the eyes of those who approach Constantinople, appear to rise above each other in beautiful order. About a century after the death of the founder, the new buildings, extending on one side up the harbour, and on the other along the Propontis, already covered the narrow ridge of the fifth, and the broad summit of the seventh hill. The incessant inroads of the Barbarians rendered it necessary for Theodorus the younger to surround his capital with an adequate and permanent enclosure of walls. The new wall of Theodosius was constructed in the year 413; and after having been thrown down by an earthquake in 447, it was rebuilt in three months by the diligence of the prefect Cyrus. The suburb of the Bocchermes was first taken into the city in the reign of Hærcius. From the eastern promontory to the golden gate, the extreme length of Constantinople was about three Roman miles; the circumference measured between ten and eleven; and the surface might be computed as equal to about 2000 English acres. The suburbs of Peræa and Galata, though distant beyond the harbour, may deserve to be considered as a part of the city; and this addition may perhaps authorize the measure of a Byzantine historian, who assigns sixteen Greek (about fourteen Roman) miles for the circumference of his native city. After all, Constantinople must yield to Babylon and Thebes, which filled the great but not incredible circumference of about 25 or 30 miles, to ancient Rome, to London, and even to Paris.

As to the expense incurred by the progress of the work, some estimate may be formed of it by the allowance of about two millions five hundred thousand pounds for the construction of the walls, the porticoes, and the aqueducts. The forests that overshadowed the shores of the Euxine, and the celebrated quarries of white marble, in the little island of Proconnesus, supplied an inexhaustible rock of materials ready to be conveyed, by the convenience of a short water-carriage, to the harbour of Byzantium. A multitude of labourers and artificers urged the termination of the work with unflagging zeal; but the impatience of Constantinople soon discovered that, in the decline of the arts, the skill, as well as the number of his architects, bore a very unequal proportion to the greatness of his design. However, the buildings of the new city were decorated by the hands of the most celebrated masters of the age of Pericles and Alexander. By the commands of the emperor, the cities of Greece and Asia were depoiled of their most valuable ornaments. The trophies of memorable wars, the objects of religious veneration, the most finished statues of the gods and heroes, of the fables and poets of ancient times, contributed to the splendid triumph of Constantinople; whence the historian Cedrenus took
occasion to observe, that nothing seemed wanting except the souls of the illustrious men, whom those admirable monuments were intended to represent. For an account of the principal buildings with which this imperial city was decorated, we must refer to the articles Forum, Hippodrome, &c. and the sequel of this article.

The baths of this city, which still retained the name of Zeuxippus, were enriched by the munificence of Constan-
tine with lofty columns, various marbles, and above thousand statues of bronze. In short, whatever could adorn the dignity of a great capital, or contribute to the benefit or pleasure of its numerous inhabitants, was contained within the walls of Constantinople. A particular description, composed about a century after its foundation, enumerated a capital or school of learning, a circus, two theatres, eight public, and fifteen private baths, 52 porticoes, five granaries, or storehouses for the meetings of the senate or courts of justice, 14 churches, 14 palaces, and 4388 houses, which, for their size and beauty, deferred to be distinguished from the multitude of Plebeian habitations. In order to furnish this favoured city with a population, corresponding to its extent and magnificence, Constan-
tine invited many opulent senators of Rome, and of the eastern provinces, to fix upon his chosen residence for their own habitation; and he devoted on his favourites the palaces which he had built in several quarters of the city, assigned them lands and pensions for the support of their dignity, and alienated the demesnes of Pontus and Asia, for the purpose of granting hereditary elates by the easy tenure of maintaining a house in the capital. By degrees, however, a variety of concurred circumstances contributed tofill the city with inhabitants. In less than a century, Constantinople disputed with Rome itself the pre-eminence of riches and numbers; and it became necessary to enlarge its extent by additional edifices, the foundations of which, on either side, were advanced into the sea, and which, of themselves, might have composed a very considerable city. The emperor also conferred, by way of additional allurement or encouragement to his plan of popula-
tion, several privileges on the settlers at Constantinople. He divided the city into fourteen regions or quarters, digni-
ified the public council with the appellation of senate, communicated to the citizens the privileges of Italy, and bellowed on the rising city the title of colony, the first and most favoured daughter of ancient Rome. The walls, porticoes, and principal edifices of the city, were com-
pleted, as some say, in a few years, or, according to others, in a few months; and the founder soon prepared to celebrate the dedication of his city, a ceremony which was attended with pompous games, and magnificent largesse. As often as the birth day of the city returned, the statue of Con-
tantine, framed by his order, of gilt wood, and bearing in its right hand a small image of the genius of the place, was enriched on a triumphal car. The guards, carrying white tapers, and clothed in their richest apparel, accompanied the solemn procession as it moved through the Hippodrome. When it was opposite to the throne of the reigning em-
peror, he rose from his seat, and with grateful reverence adored the memory of his predecessor. At the festival of dedication, an edict, engraved on a column of marble, be-
lowed the title of Second, or New Rome, on the city of Con-
stantine. But the name of Constantinople has prevailed over that honourable epithet, and, after the revolution of fourteen centuries, still perpetuates the fame of its author.

It has been conjectured, that the removal of the imperial residence from Rome, contributed to hasten the downfall of the empire: but it is certain, that the fixing of it at Constan-
tinople, put a heal period to the passage of the Barbarians, through the Bosphorus. They could never after force that immoveable barrier, and Greece, as well as Asia Minor, felt secure from their ravages, until Valens undis-
votedly suffered the Goths to pass the Danube, and received their armed bands into the heart of the empire.

Constantine the Great did not long enjoy his new refi-
dence. He died the 22d May, 337, and by his will divided his vast empire among his three sons, Conflantius, Con-
flans, and Conftantine. Within three years after their fa-
th, Conflans invaded the dominions of his brother Con-
flantius, who, being drawn into an ambush and slain, left Conflans in possession of two-thirds of the Roman em-
pire. But Magnentius revolting soon after against Conflans, surprized him hunting, and pursuing him in his flight, put him to death. Magnentius being in the next place defeated by Conflantius, terminated his life by suicide; and thus, by the diffatuated fate of his brothers, Conflantius became sole emperor in 333; and twenty years after the seat of the empire had been removed to Constantinople.

At the death of Conflantius, which happened in the year 361, Julian, commonly called the Apolite, son of Julius Conflantius, and nephew to Conflantine the Great, assumed the imperial purple. He marched soon after against the Perian, and was so infatuated by his expectations of con-
quest, as to destroy the fleet of boats which he had upon the Tigris. Allured by spies who pretended to be defter-
ers, he advanced far into an unknown country. His army found itself at last in the midst of fancy deferts, and felt the dreadful effects of famine. The guides suddenly disappeared, and the Perian monarch approaching, with the whole military force of his kingdom, wanted of provisions rendered a retreat necessary, in which the troops were continually ba-
ralled by the Perians, who carefully avoided any close en-
gagement. In spite of the incessant attacks of the Perian cavalry, the Romans succeeded in gaining the banks of the Tigris, but for want of their boats they could not pass the river. Exhausted with fatigue, and perishing with hunger, they still repulsed the attack which the Perian king made on their camp. In the confusion of the battle, Julian received a mortal wound, of which he died in a few hours, on the 20th of June, 363.

This emperor had conceived the project of extirpating the Christian religion; and if he had appointed, or if the army had elected an emperor equally averse to Christi,nity, his death could not have dispelled the storm that was gathering over Christendom. Fortunately, Jovian, a Christian officer, was chosen emperor. Forced to conclude a disadvantageous peace with Peria, he purchased a safe retreat by the cession of Mopota, and the strong cities of Nisibis and Singara.

Jovian dying in 364, soon after the conclusion of the peace with Peria, Valentinian, another Christian command-
er, was decorated with the imperial purple. He named his brother Valens his colleague in the empire, affixing him the eastern part, whilst he himself ruled the west. It was in this reign that the first step towards the subversion of the western empire took place. The Huns, a Tartar nation, being driven out of their own country, rushed like a torrent upon the Goths, on the north side of the Danube, who, seeing their possessions invaded, presented themselves in immense crowds on the banks of the river, and required an asylum in the Roman dominions. They delivered up their children, at least those of rank, as hostages; but were un-
fortunately suffered to retain their arms. The number of Goths who passed the Danube on the occasion, was computed at about 220,000 armed men, with their wives and children.
children along with them. A second army of Goths, coming to the banks of the Danube with the same result, was routed: but they passed without leaving, and being ill supplied with provisions, they joined their countrymen, and commenced a war against the empire. After various skirmishes, Valens, without waiting for his nephew Gratian, who was on his march to join him, gave battle to the Goths, in the plains of Adrianople, A.D. 378, and was totally defeated. The loss on the side of the Romans was so great, that this defeat was considered as the most severe since the battle of Cannae. Valens was never more seen. It is supposed that he was consumed in the flames of a cottage where he had taken refuge.

By the death of Valens, the empire fell into the hands of his nephew Gratian, who had done time before succeeding to Valentinian in the west. But at the end of the year 378, he declared Theodosius his partner in the empire, and committed the East to his care.

Theodosius was a native of Spain. In four years and a half he terminated the Gothic war. The Goths had lands assigned to them in the Roman provinces, and submitted to the Roman sceptre on condition of being governed by their own laws.

Theodosius was in every respect a second Constantine the Great. Like him he rendered the empire triumphant over all its enemies, extingushed intelline commotions, established Christianity upon a solid basis, and divided the empire between his two sons Arcadius and Honorius, assigning to the former the eastern, and to the latter the western part. From that period, the two monarchies, forming two separate and independent states, gradually became strangers to each other, and even regarded each other's prosperity with a jealous eye. Rome fell a prey to the Goths, whilst Constan tiople appeared totally unconcerned at the event. Theodosius died at Milan, the 17th of January 395, in the sixteenth year of his reign, and the fiftieth of his age.

After the death of Theodosius, the history of Constan tiople affords nothing remarkable, until the total destruction of the Roman empire in the west by the Goths. Towards that time Balilicus usurped the Eastern empire. Afflicted in his conspiracy by the empress Verina, his fitter, he drove out Zeno, the lawful emperor, who fled into Ifauria, whether he was pursued by Ilus and Trecondes, two of the usurper's generals, and forced to flit himself up in a caffle. But Balilicus having lost his popularity by his cruelty, his generals joined Zeno and restored him to the throne. Bais liucus perished in a dungeon in the year 457. He had reigned about twenty months. During his usurpation, a dreadful fire happened at Constan tiopol e; together with a considerable part of the city, it consumed the imperial library which is supposed to have contained 120,000 volumes.

Zeno had the good fortune to escape other conspiracies that were formed against him: but he was unsuccessful in the wars which he waged against the Ostrogoths, and purchased a short peace at the expense of the provinces of Lower Dacia and Moesia. Theodoric, king of the Ostrogoths, soon renewed his irritations into Thrace, and advanced with fifteen miles of Constan tiopol e, which he was expected to besiege, when he suddenly turned his arms against Odovacer, king of Italy, whom he subdued. Theodoric himself was proclaimed king of Italy in his room, two years after the death of Zeno, which happened in 491.

The administration of the following year was equally weak. Theodoric, however, reigned in Italy under the sanction of the imperial court of Constan tiopol e, and still acknowledged himself a vassal of the eastern emperor, but on his death the kingdom of Italy devolved upon his beautiful and accomplished daughter, Amalasonttha, and her dame, which happened in the year 535, the Goths of Italy refused to acknowledge the paramount authority of the imperial court, and renounced all dependence on the empire. Justinian was then reigning at Constan tiopol e. His uncle Justin, who ascended the throne in 518, after Athanarius, had named him his colleague in the year 527, and dying soon after, had left him sole master of the empire. He first turned his whole force against Chosroes, king of Persia, dispatched his general Belfarius against him, and after a severe defeat, forced him to sue for peace.

About this time, a great tumult happened at Constan tiopol e. It began among the different factions in the circus. Hypatius, nephew to Athanarius, was proclaimed emperor. To crush this faction, Justinian sacrificed two of his ministers who were most obnoxious to the people, but the multitude grew more outrageous, and several senators having joined the rebels, the emperor felt so much alarmed that he thought of abandoning the city, and making his escape by sea. Encouraged, however, by his empress Theodora, he resolved to defend himself to the last with the few senators who had not yet abandoned him. In the mean time, Hypatius was carried in triumph to the circus, where he was beholding the sports from the imperial throne, among the acclamations of the populace, when Bel farius on his return from Persia entered the city with a considerable body of troops. He immediately marched to the circus, fell sword in hand upon the disarmed multitude, and took Hypatius the usurper, and Pompey, another of the nephews of Athanarius, prisoners. They were both beheaded, and their elates, as well as those of the senators who had joined them, con fiscated.

Justinian next turned his arms against the Vandals in Africa, and the Goths in Italy. Bel farius entered Rome A.D. 536, where he was bejeweled by the Goths. His gallant defence, with only five thousand veterans, against a numerous army of Goths, commanded by Vitiges their king, during the space of a whole year, is deemed one of the most signal military exploits recorded in history. He made many successful forays. In one single assault the Goths are reported to have lost 30,000 men. They were obliged to raise the siege on the arrival of fresh troops from Constan tiopol e. At length the Gothic kingdom of Italy was completely subdued. Vitiges the king was sent to Constan tiopol e. Justinian assigned him for maintenance a rich estate in Aia Minor, and on his conforming to the Athanarian creed, conferred upon him the rank of Patrician and Senator, which still continued as an honorary title in the empire.

Gellimer, king of the Vandals, over whom Justinian had triumphed, had likewise an ample estate assigned to him, but could not enjoy any honorary title on account of his professing Arianism.

In the year 546, the Goths again revolted under the command of Totila, whom they had elected king. Bel farius a second time entered Italy, and retook Rome in 547, but at his recall it was again captured by the Goths. The command of the army of Italy was then conferred on Narces, an eunuch of great military skill and the most daring courage. This general defeated and slew Totila the Gothic king, and made himself master of Rome in 552. He likewise defeated and slew Ticius, who had succeeded Totila as king of the Goths, and made a prodigious slaughter of the Franks and Allemanni, who invaded Italy soon after. Italy was then made a province of the eastern or Byzantine empire, and a government established under the denomination of the Exarchate, of which Narces was the first exarch.
By the conquest of Italy and Africa, Justinian gave to the Eastern empire an augmentation which it had never before possessed. He displayed consummate political abilities, during a reign of thirty-eight years, and exhibited, during a life of eighty-three, a singular indulgence of long continued personal prosperity. He has left a noble monument of his legislative talents in his code of laws, and no less noble one of his skill in architecture, in the magnificent cathedral of St. Sophia at Constantinople, now a Mahometan mosque. His reign is also the important era of the transplantation of the Sclavonic from China to Constantinople. The brilliance of Justinian's reign was, however, in some degree clouded by great calamities of a physical nature. Tremendous earthquakes happened almost every year throughout the whole extent of the empire. A dreadful pestilence spread from Pelusium in Egypt, over the greater part of Asia, Africa, and Europe. During the space of three months, from five to ten thousand individuals died daily in Constantinople. Many cities in the East were almost depopulated, and in some parts of Italy, the harvest rotted on the ground. This cause, which began in the eleventh year of Justinian's reign, was not extinguished in less than fifty-two years.

Justinian died in the year 565. Soon after his death the Eastern empire began to decline. After the succesive reigns of Justin II, and of Tiberius, which filled up the interval, from the death of Justinian to the accession of Maurice in 582, a spirit of revolt manifested itself in Constantinople, and terminated in the deposition of Maurice, and election of Phocas the ceturion in 602. Phocas was in his turn deposed and put to death by Heraclius, A. D. 610, whose reign is remarkable for a most obstinate contest with Persia, to which country it proved finally fatal.

During a period of twelve years, from 610 to 622, the Eastern empire exhibited a scene of almost unexampled distress. From the Adriatic to the suburbs of Constantinople, the provinces were ravaged by the Chal. Avars, who had subdued the Huns and reigned in the royal village of Attila, in the great plain of Hungary, and a Persian army was encamped at Chalcedon, now Sutari, on the brink of the Bosphorus, directly opposite to Constantinople. The general consternation was so great that the emperor was about to leave the city, and transport himself with the treasures of the imperial palace to Carthage, when the patriarch of Constantinople led him to the altar of the church of St. Sophia, and made him take a solemn oath that he would live and die with his people. Heraclius having thus solemnly bound himself to the defence of his country, carried on the contest to the very centre of the Persians dominions. He every where defeated the numerous forces of Chosroes, whose continual disasters excited a general revolt of the Persians. Chosroes was deposed A. D. 628, and Siros his son proclaims king. The latter put to death his father and eighteen brothers, and then combines with Heraclius a treaty of peace, in consequence of which, the former boundaries of the Byzantine and Persian empires were restored.

The northern nations, which had overthrown the Roman empire in the West, were yet in an unsettled state, and Europe exhibited the most disquieting scene of barbarism and anarchy, whilst Constantinople was triumphing in the successful termination of a war, which had threatened the extinction of its empire. It was, however, soon to witness horrors similar to those with which the West had been famished for the space of two centuries. About the year 609, Mahomet, an Arabian, assumed the character of a prophet, and assembling together a determined and daring band, in whom he excited military enthusiasm by means of religious tenets, calculated to flatter their pious,
half of its possessions by the conquests of the Mahometan caliphs. Under Charlemagne, the whole world was divided into the Eastern, Saracen, and new Western empire. Of these the Saracen empire, under the caliphs, formed on the highest in literary attainments; Conantinople, though much declined, still held the second rank; and the rest of Europe was making some advances towards the restoration of learning, when Charlemagne, by dividing his new empire among his sons, rekindled it into barbarism.

In the ninth century, the Bulgarians, who had commenced their attacks towards the latter end of the tenth, and renewed their inroads at different periods, continued to be formidable enemies. They were completely subdued by Bascius II, towards the end of the tenth century. It was about the same time that the empire of the Saracens, being, like that of Charlemagne, split into a number of independent states, by the revolt of factious and ambitious chiefs, fell a prey to the Seljukian Turks and other barbarous nations of Asia.

This subversion of the caliphate was attended with the complete wreck of Arabian learning; and the Byzantine empire remained the sole depository of all that was worthy of notice in literature, commerce, and the arts and embellishments of civilized society. Thus the tenth century, which, in the western countries, was one of the darkest periods of Gothic ignorance, constituted the most flourishing era of the Byzantine learning, under the reigns of Leo the philosopher and his son Conantinople Porphyrogenitus.

About the year 1063 the emperor Conantinople XI. Ducas, at his death, the empire to his three sons, Michael, Andronicus, and Conantinople XII., and appointed the empress Eudocia regent during their minority, on condition that she should not marry again. But having been released from her engagement, through a stratagem practised upon the patriarch, who absolved her of the oath she had taken, Eudocia married an officer of great military merit, named Romanus Dogerizes, who was proclaimed emperor. After various successes against the Turks, who were continually encroaching upon all sides of the empire, Romanus was wounded in a desperate engagement, and taken a prisoner. Before his return to Constantinople, Eudocia was driven from the throne by John, the brother of Conantinople Ducas, and her eldest son, Michael Ducas, proclaimed emperor. Romanus was besieged in a strong castle, whither he had retired, and killed in the year 1067, after a reign of three years and eight months.

Immediately after the death of Romanus, the empire was again invaded by the Turks. In less than ten years they made themselves masters of all Media, Lycaonia, Cappadocia, and Bithynia. At last Alexius Commnenus, having wrested the empire from Nicephorus Botaniates, who had deposed Michael Ducas, prepared for war with so much vigour, that Solyma the Turkish Sultan made proposals of peace, to which Alexius acceded, in order to defend himself in the west against the Italians, under Robert Guichard, duke of Fuglia and Calabria, whom he defeated, with the assistance of the Venetian fleet. He also forced the Scythians, who had had walls great part of Thrace, to submit on his own terms.

The war with the Turks was renewed in 1083, and carried on with various success. But about the year 1095, a romantic scene of religious enthusiasm and military enterprise began to display itself; and though it threatened the utter ruin of the Turkish nation, proved finally fatal to Constantinople.

Under the polluted empire of the caliphs, the frequent pilgrimages of Christians to the holy sepulchre at Jerusalem had been encouraged; but the barbarians who had overthrown the caliphate oppressed the pilgrims with unreasonable impositions, and often added insult to injustice. Incensed at these outrages, Peter, a hermit, who had visited the holy sepulchre, preached a crusade for the recovery of the holy land from the infidels. The pope approved the project, and the princes and nobles of Europe readily entered into the measure.

This religious war was carried on, with some intervals, during the space of almost two hundred years, from the setting out of the first crusade in 1095, to the loss of Antioch and all Palestine in 1291. Innumerable armed bodies were collected out of England, France, Germany, the Netherlands, and Italy. Yet these tremendous efforts were not attended with effects of such permanency as might have been expected. But one of the most remarkable events which occurred in the course of the !udes, was the capture of the city of Conantinople by the Latin church.

The emperor, Isace Angelus, having been deposed and deprived of fight by his inhuman brother, his son, Alexius, who was only a youth, made his escape into Italy, and met with a number of the barons of France and Flanders, who were come to Venice to contract with the republic for the ships necessary to facilitate one of those crusading enterprises. He concluded with them a treaty, whereby they engaged to restore his father to the imperial throne of the East, and he promised to unite the Greek church to the Latin church. The French and Venetians, changing the destination of their armament, sailed for the Hellepont to Conantinople, broke the chain of the harbour, and assaulted the city. When they were almost ready to enter the town, the usurper made his escape. Isace Angelus and his son, the young Alexius, were proclaimed joint emperors. A cessation of arms took place: but as soon as the clergy under-fooed the terms of the treaty concluded by young Alexius, they reproved the idea of an union with the see of Rome, and cited the people to fly to arms. The insurrection was also fomented by Alexius Mourzouffe, of the family of Ducas, who assumed the purple, imprisoned the blind emperor Isace, and put young Alexius to death. The legal succession of the Greek empire being thus overturned, the French and Venetians recommenced the war. After a siege of more than three months, they assaulted the city from the harbour, and carried it by storm, eight hundred and eighty years after its foundation by Conantinople. The city being given up to pillage, the plunder was valued at 4,000,000 marks, nearly equivalent to 800,000. Berlin, the greatest sum ever found in any captured city previous to that period; and notwithstanding the penalties of excommunication, and even of death, denounced against any one who should secrete any part of the spoil, the secret plunder is supposed to have exceeded what was produced in public. Baldwin, earl of Flanders, was elected emperor, with one-fourth part of the empire for his share: the rest was divided among the barons and knights, into fiefs, held under the emperor.

The Greeks, after this disaster, established independent states at Nice, Trebifond, and Epirus. The Latins were not prosperous in their newly-acquired empire. The conquests which prevailed among the barons, laid their dominions open to the attacks of the Greeks. They continually gained ground. The Bulgarians also revolted, and the emperor, Baldwin of Flanders, being defeated and taken prisoner by them, died in captivity. He was succeeded by his brother Henry, who shewed himself of equal capacity for peace and war.

Henry checked the proceedings of the popish legate, in the pericution of the Greek schismatics. But after his death, which happened in 1216, the Latin empire of Conantinople rapidly declined: and so pressing were the exigencies of the state, that Baldwin II., the last emperor of
the Latin dynasty, pledge to the Venetians the crown of thorns pretended to have been worn by Chirl.

At last Michael Palaeologus, having usurped the Greek empire of Nice, his general, Alexius Strategopulos, with an inconsiderable force, surprized and recovered Constan
tinople in 1361: and thus, after a period of 57 years, that metropolis returned under the dominion of the Greeks. But a considerable part of the city had been destroyed in the three dreadful conflagrations which happened at the time of the siege and capture by the Latins: Constantinople never more regained that splendour which it had along main
tained. The imperial palace, which, during eleven cen
turies, had been the admiration of all who visited the East, was in ruins. It stood between the Hippodrome and the magnificent church of St. Sophia. Its superb gardens de
cended by several rows of terraces, to the shore of the Propontis. The primitive edifice, erected by Constantine, rivalled the palace of the Caesars on the Palantine Mount. The improvements made by his successors still added to its magnificence; and the emperors of the Comnenian dynasty had taken particular delight in embellishing this imperial resi
tence.

The invariable enmity of the clergy and people of Con
tinonople against the Latin church still subsisted. To avert a crusade, which the Latins were meditating against Constantinople, Michael Palaeologus negotiated with the pope, and concluded a concordat between the Greek and Latin churches; but at his death, in the year 1282, the union was dissolved. His son Andronicus, who succeeded him, restored the ancient Greek ceremonies, and by this imprudent step threw the empire into a new ferment.

In the mean time Constantinople was still worked upon by the Greeks, who continued their encroachments: but his valour rendered him conspicuous by the emperor. Con
tinople was transformed into a prison. On his removal from the army, the Turks in the famous Othoman murdered them
efelves masters of several places. Philanthropenus and Liba
darius, two officials of great merit, were sent to oppose them. The former gained some advantages over the ene
my: but elated with his success he caufiled himself to be proclaimed emperor. This rebellion however was soon sup
presse. Philanthropenus was betrayed by his own men: but the Turks taking advantage of these internecine commo
tions extended their dominions in Asia, conquered most of the island, and advanced into the Medi
cal plains of Greece. Andronicus, not trusting his subjects, hired the Maslakes to affright them; but they were defeated, turned their arms against him. He next applied to the Catalans who behaved in the same manner, and, in 1292, affailed the empire in conjunction with the Turks. This was their first appearance in Europe. Their enterprise this time proved unsuccessful.

New commotions having taken place in the empire, the Turks returned to the charge in 1327. The next year, however, Othoman, who may be styled the founder of the Turkish monarchy, being dead, the emperor recovered Nice and some other places, which were again lost the year fol
dowing; and, in 1330, a peace was concluded, which left the Turks in possession of their conquests.

This peace the Turks broke in 1357. Having reduced all Asia, they passed the Hellespont, and took a strong castle on the European side. Soon after Sultan Amurath, advancing still farther, made Adrianople the seat of his empire. He was slain by treachery, and succeeded by his son Bajazet, who levied a yearly tribute on the emperor of Constantinople, and commanded him to send his son Manuel to attend him in his military expeditions. This demand was complied with. But the emperor dying in 1392, Manuel hastened to Constantinople without taking leave of the sultan. This incensed Bajazet so highly, that he passed with great expedition into Thrace, ravaged the country adjoining Constantinople, and at last invaded the city both by sea and land. In this extremity, Manuel had recourse to the western princes, who sent him an army of 130,000 men, under the command of Sigismund, king of Hungary, and John count of Nevers. After a few sieges they were defeated with great slaughter by Bajazet, who returned the siege of the city, and would infallibly have accom
dplished the conquest of Constantinople had he not been obliged to turn his forces against Tamerlane the victorious Tartar, by whom he was overcome in battle, and confined in an iron cage against the bars of which he beat out his brains in the year 1399.

But as this relief could not be expected to be of long du
ration, Manuel Palaeologus felt the necessity for Venice, and from thence visited London and Paris in the year 1400. In the reign of Henry IV. of England and Charles VI. of France, with the view of procuring some assistance, which the circum
cstances of those countries did not permit them to grant. He also endeavoured to negotiate an union with the Latin church; but the negotiation broke off. His son John Palaeologus, who succeeded him, was more fortunate. He concluded a treaty at Florence with pope Eugenius IV.; but it was universally reprobated by the whole body of the clergy of Constantinople, and the emperor was obliged to renounce it. He did not long survive these unhappy disturb
ances, and, in 1448, left the empire now confined al
most within the walls of Constantinople to the last Con
stantine.

Upon the near prospect of being besieged in his capital by the Tartar Turks, Constantinople renewed the concordat with the Latin church. A cardinal legate from Rome was admitted at Constantinople; but after he had officiated in the cathedral of St. Sophia, the Greek clergy abandoned it as a polluted temple, and the whole city of Constantinople displayed every extreme of fanaticism and avarice against the Latin church. Though reduced to a narrow corner between the Propontis and the Bosphorus, the Byzantine empire continued the theatre of crimes and political as well as fanatical faction, until the 26th of May, 1453, when, after a siege of 53 days, Constantinople was taken by the Turks under Mahomet II. Whatever may have been the strength of the army which the Turks brought against that celebrated metropolis, the force, which the minister was able to enroll by the emperor's command for its defence, was inconsiderable. They were only 4970 volunteers, and including the Italian auxiliaries, the empe
nor's troops did not exceed 8000 men.

Constantine Palaeologus made a vigorous defence, and rashly refused advantageous terms of capitulation. When the city was at last carried by assault, he nobly fell in the breach by which the enemy entered Constantinople. A shocking scene now followed. The persons and property of the citizens were given up to the disposal of the conquer
ning army. The terrified people fled to the cathedral of St. Sophia and other asylums, from whence they were dragged forth, and without any distinction of sex or rank, chained together, driven through the streets like beaals, and more than sixty thousand of them sold into slavery. Mahomet, at the expiration of the three days allotted for pillage, made his triumphal entry into Constantinople, which he named the capital of the Ottoman empire, and which has ever since held that station. See Turks.

Such was the dreadful catastrophe of Constantinople, once the metropolis and long the sole exiling remnant of the
the Roman empire. It fell a prey to the Turks 1043 years after Rome was taken by Alaric, and 977 years after the entire subversion of the western empire. Gibbon's Hist. of the Decline and Fall of the Roman Empire, p. 756. Le Beau, Histoire du Bas Empire. Bigland's Letters on Ancient and Modern History.

Constantinople is called by the Turks Stamboul, Hfampol, or (according to Thornton's present State of Turkey, p. 729) Stamhpal, abounding in faith. It is situated at the eastern extremity of the province named Romania, or Romania, on the European side of the Bosphorus, or Straits of Constantinople, which separates Europe from Asia; in N. lat. 41° 10'. 330 miles S. E. of Vienna and 500 E. of Rome. It rises gradually from the shore in the form of an amphitheatre; but the streets are narrow, and the houses, in general, mean; the most spacious not exceeding two stories in height. The street called Adrianople is the longest and broadest in the city. The public buildings, such as the palaces, the mosques, bagnios, bazaars, and caravanserais or khans, for the entertainment of strangers, are many of them very magnificent. On one point of the triangle, on which the city is built, is the feraglio from whence there is a charming prospect of the delightful coast of Asia Minor. This inclosure of the Ottoman palace is separated from Constantinople by a wall thirty feet high with battlements, embrasures, and towers, in the style of ancient fortifications. Its circumference is above six miles. There are in it nine gates, but only two of them remarkable for their size and beauty. It is from one of these the Baba Hoamajun, or Sublime Porte, that the Ottoman court is supposed to have taken the name of the Porte, or Sublime Porte, in all public transactions and records. But Mr. Thornton, in his present State of Turkey, page 117, contends that the palace of the grand vizir, by a metaphor familiar to most of the Eastern languages, is called the Porte or King's gate, in Persian Dar, being, as it were, the door of communication between the sultan and his subj ects, and corresponding with the European appellation of a court which follows the person of the sovereign.

The feraglio is so extensive, that it is supposed to occupy the whole of the ground on which the ancient city of Byzan tium stood, and to contain 10,000 inhabitants. That wing of the feraglio which is exclusively appropriated to the ladies of the Grand Signor, is called the Harcum. Among the ancient monuments preserved in the feraglio, is the tomb of Conстантин the Great. Of the mosques, or Turk ish churches, the most celebrated is that of St. Sophia, which fronts the great gate of the feraglio, and is thought, in some respects, to exceed in grandeur and architecture St. Peter's at Rome. Round it are several chapels, which serve as burial-places for the imperial family. The other mosques of sultan Achem, sultan Mahomet, sultan Selim, sultan Solyman, and sultan Dajazet, are also very fine. These imperial mosques are founded chiefly by sultans, who have obtained victories, and devote the spoils of war, gained from the enemies of their religion, to the service of public worship, the instruction of youth, and the relief of the poor. Foundations of this kind are annexed to every mosque. There are in Constantinople 118 fæminaries of learning, and 1270 primary schools. The Greeks, besides their patriarchal church, dedicated to St. George, have 22 others. The palace of their patriarch is on a hill, about two hundred paces from the harbour. The Armenians have an archbishop and three churches; the Roman Catholics have fix convents, and the Jews several synagogues. There is also a Swedish Lutheran church.

The bazaars, or belligins, answer to our markets. They are squares enclosed within gates, where merchants meet for traffic, having generally two rows of shops built under piazzas. The market of female wares, Avarat Bazar, is a quadrangle, surrounded by a covered gallery, and ranges of small and separate apartments; but Mahometans only are admitted.

The bagnios, or public baths, are elegant and noble structures, built with hewn stones; the inner chambers are capacious, and paved with slabs of the rarest and most beautiful marble.

At the south end of the city, is the formidable flate prison of the seven towers, built of fine free-flour, and surrounded by a wall, with several smaller towers.

There are no theatres at Constantinople; the Ombres Chinoifes, which are sometimes exhibited in the streets, supply the want of dramatic exhibitions. Of other public amusements, the principal are wrestling, and throwing the javelin, on horseback, in the ancient Hippodrome, an oblong square, called by the Turks Ali-cdilim.

Constantinople counts 35 public libraries, some of which contain 10,000 volumes. That which was founded under Mustafa III. by the vizir Racub Pasha, is the most modern. A renegado, of the name of Ibrahim, encouraged by the grand vizir, Ibrahim Pasha, and the Mufti Abd'ullah Efendi, introduced the first printing-prets at Constantinople, in the year 1727. It was afterwards destroyed by some fanatics, but Abdul Hamid reforted it. Only the Koran, and books treating of the law and the doctrines of the prophet, are forbidden to be printed. These circulate in manuscripts, and afford a comfortable subsistence to 20,000 individuals who live by copying them.

The trade of Constantinople is chiefly in the hands of the Jews, Armenians, and Greeks; and its commerce is carried on by foreigners of all nations, who are confounded under the general name of Franks. No restrictions are laid on commerce, except in the articles necessary for the support of human life; the exportation of which is sometimes prohibited, especially from Constantinople, where alone the prohibition is rigorously enforced. Besides silk, cotton, wool, flax, drugs, coffee, sugar, wax, honey, fruits, hides, and tobacco, Constantinople exports its own printed muf lin, the foutain, silk Guffs, and velvets; of Brins and Alle ppo, the ferges and cameotts of Angora, the ripes and gauzes of Salonica, the sword-blades of Damasces, and the carpets of Smyrna. The harbour is spacious, and suppos ed capable of holding 1200 ships. Near it is Galata, a suburb chiefly inhabited by Greeks, Armenians, Jews, and Franks, who have their warehouses here. Beyond this is Pera, which may be considered as the suburb of Galata, where the foreign ambassadors reside. The air is uncommonly healthy, and the prospect delightful. Near Pera is the quarter called Topsham, from its cannon foundry.

According to Mr. Dallaway, the population of Constantinople, including its suburbs, does not exceed 400,000 souls, of whom 200,000 are Turks, 100,000 Greeks, and the remainder Jews, Armenians, and Franks, or strangers from all the European nations. Mr. W. Etton (in his Survey of the Turkis Empire, second edition, page 297.) brings it down to less than 300,000. But this computation is evidently too low. At the time of its capture by the Latins, Constantinople is supposed to Villehardouin to have contained 400,000 effective men; this, however, must be regarded as an exaggeration. Mr. Le Beau, in his Histoire du Bas Empire, supposes that it contained then about one million of inhabitants, and that its present population amounts to 400,000, which, by all accounts, is the most probable computation.

Constantinople is frequently visited by the plague, which, however, excites but little alarm, and Turkifh indifference.
counteracted all efforts to subdue this dreadful epidemic disorder. From the year 1783 to 1785, it swept away 100,000 children and young people. The city has also often been exposed to great conflagrations. In 1782 a fire consumed from 7 to 8,000 houses, among which were some belonging to the officer of the late. On the 5th of August, 1784, more than 10,000 buildings were laid in ashes, and towards the end of the same year, 1600 houses and mosques were burnt down. In 1788 there was so extensive a conflagration as to threaten the entire destruction of the city. They generally originate in the discontent of the Janizaries, or other military bodies. In the latter revolution, which they effected on the 28th of May, 1807, when they forced Selim III. to abdicate the throne, and proclaimed Mustapha IV. emperor, they contented themselves with cutting off the heads of a few ministers and military chiefs. But between the fifth and sixth day of August following, three great fires reduced several hundred houses to ashes, and are supposed to have proceeded from the strong dissatisfaction that prevailed in the mutinous army against the new grand vizier, for having refused an order to pay the troops on the 11th of the camp. In time of peace the Janizaries watch over and secure the public tranquillity, and execute all the functions of police officers. A foreigner, who would be inflicted if he were alone in the streets of Constantinople, may walk any where without the least molestation if accompanied by a Janizary. See Janizaries. (D'Osson’s Tableau General de l’Empire Ottoman. Eton’s Survey of the Turkish Empire. Thornton’s present State of Turkey.)

CONSTANTINOPLE, Patriarch of. See Greek Church.

CONSTANTIUS, Flavius Valerius, in Biography, surmamed Chlorus from the paleness of his complexion, was the son of Eutropius, a Dardanian noble, but his education did not correspond with the tyle of his birth. Under the emperors Aurelian and Probus, he had learned the military art, and by the emperor Carus, he was appointed governor of Dalmatia in the year 282. Ten years afterwards, in conjunction with Galerius, he was made Caesar, and associated with the emperors Diocletian and Maximian. To Constantinople were assigned the provinces of Gaul, Britain, and Spain. At this time Carausius, an ambitious general, had excited a revolt in Britain, and carried matters so far as to assume the imperial authority; he was also in possession of the port and fleet of Boulogne. To oppose the usurper, Constantius first attacked Boulogne, which surrendered to his arms, together with a great part of the naval strength of the place. After this, Constantius employed three years in preparing a fleet for the conquest of Britain; he scourged the coast of Gaul, invaded the country of the Franks, and deprived the usurper of the assistance of those allies. Before the preparations were finished, Carausus was deposed and murdered by his own servants. Allectus, his prime minister, succeeded to his power and to his danger. But he did not possess equal abilities, either to exercise the one or to repel the other. Constantius, under favour of a thick fog, cleared the British fleet, and landed in safety on the western coast, where an engagement took place, in which Allectus was slain; a single battle decided the fate of this great island, and when Constantius landed afterwards on the shores of Kent, he found them covered with obedient subjects. He now had occasion only to exert his talents in establishing a regular government; to which he appears to have been fully competent; he reigned with mildness, and was anxious not to oppress his subjects by heavy taxes; his court was distinguished by simplicity and great frugality, and he himself was a decided enemy to the perfections which disfigured the reigns of Diocletian and Maximian; but in which, as their superior, he was obliged occasionally to join. When, how-
the warrant, than he relented, and endeavoured to recall the bloody mandate; but that the second messenger entreated with the representative, was detained by the eminence, who dreaded the unforgiving temper of Gallus, and were likewise deems of reuniting to their empire the wealthy provinces of the East. Some time after the event, Syvanus, a Frang, who had been in the confidence of the emperor, and who had been of the utmost importance to him in his contests with Magnentius, was, by false accusations, driven into rebellion. He assembled an army at Cologne, but was affiliated before it could be properly organized. The barbarian tribes of Germany, resolving to be revenged for his death, burst into the province, destroyed many cities, and among the rest Cologne itself, and reduced the empire to the most alarming danger. Julian, the remaining nephew of the emperor, was sent against them, and returned victorious. In 357, Constans paid a visit to Rome, where he was received with the highest honours. He displayed his regard for the ancient capital, by adding to its ornaments an obelisk of granite in a single piece, brought from Egypt, and set up in the Circus Maximus. After this, he engaged in other wars, and was in general successful. His nephew Julian became now his rival; his high reputation in the army, induced the soldiery to proclaim him Augustus, but the emperor refused to acknowledge him as partner in the empire, and began to make preparations to assert his own rights over that of his adoption. Julian had imported him, and had already feized upon Illyricum; in pursuit of him there, Constans was feized with a fever, which at first threatened no serious consequences, but which terminated his life, and thus delivered the country from the horrors of a civil war. He died in November 361, having reigned twenty-four years. He obtained the character of a zealous Christian, and is applauded for having discouraged Pagan rites and ceremonies. He built many churches, and behaved with great respect towards the clergy; in matters of speculation and theological controversy, he considered himself an adept; was himself a favourer of the Arian party, and the persecutor of Athanasius, and of those who maintained his doctrines. It must be confessed that the genuine principles of Christianity were never understood by any of the Roman emperors; and their support of it, however laudable their motives might be, was highly injurious to its progress in the world. Gibbon. Unit. Hist.

CONSTANS, in Lutw., the name of a certificate, which the clerk of the pipe, and auditors of the eschequer, make at the requel of any person, who intends to plead or move in that court for the discharge of any thing; and the effect of it in, the certifying what (appears) certat. on record, touching the matter in question. 3 & 4 Edw. VI. cap 4. and 13 Eliz. cap. 6.

A certat is held to be superior to an ordinary certificate; because this may err or fail in its contents, that cannot, as certifying nothing but what is evident upon record. Also the exemplification under the great seal of the inrolment of any letters patent, is called a certat. Coke on Littl. 225.

CONSTELLATION, in Astrologny, an assemblage or system of several stars, expressed and represented under the name and figure of some animal, or other thing: this assemblage is by some called also an asterism. The ancients portioned out the firmament into several parts, or constellations; reducing a certain number of stars under the representation of certain images, in order to aid the imagination, and the memory, to conceive and retain their number, disposition, and even to distinguish the virtues, which astrologers attributed to them: in which sense a man is said to be born under a happy constellation, i.e. under a happy configuration of the heavenly bodies. The division of the heavens into constellations is very ancient, and probably, as old as astronomy itself; at least, it was known to the most ancient authors extant, whether fact or profane. In the book of Job, mention is made of the names of some of them; as in chap ix. 9. "Which maketh Arcturus, Orion, and Pleiades, and the chambers of the south." By the "chambers of the south," some have understood the constellations near the south pole, which are invisible to the inhabitants of the northern hemisphere. From the manner in which Job speaks of commerce, we may infer that he lived in a country frequented by merchants, who imported thither the rarities of the south. To this purpose Sir Isaac Newton suggests, (Chronology, p. 157.) that Job, who lived in Arabia Petraea, among the merchants, might have derived from them his knowledge of the constellations. And again, mention of them occurs in that sublime expolation, chap. xxxviii. 31, 32. "Canst thou refrain the sweet influence of the Pleiades, or loosed the bands of Orion? Canst thou bring forth Mazzaroth, (by which some understand the twelve signs, or zodiac,) or canst thou guide Arcturus with his fons?"

The first of the three constellations, mentioned by Job, is אטְרִיֵכְו, or אטְרִיֵכְו אטְרִיֵכְו, by which some have thought that he meant the constellation, now called the Great Bear. The root of אטְרִיֵכְו is אטְרִיֵכְו אוּחְיָה, which, in Hebrew, signifies, 'to gather together, or to assemblce;' and in Arabic, "to make a circuit, or to describe a circle." These two significations may very well be applied to the Great Bear, which is a group of stars making a remarkable circuit round the pole. "Canst thou guide (or feed) אטְרִיֵכְו with his fons?" (chap. xxxviii. v. 32.) is an expression which figuratively represents the stars that compose the Great Bear, collected together, like a flock which feeds in a meadow. In the same strain Virgil says, (Aen. 1. v. 611.) "Polus dum fidea pacent." It has been further observed, that אטְרִיֵכְו is the first star named in Job; and that ארָה, or the Great Bear, is the first constellation mentioned by Homer, in his description of the shield of Achilles. The second constellation or group of stars mentioned by Job is כֹּלָנָה כֹּלָנָה. From the different significations in which this term occurs, we may reasonably conclude, that it must be understood of some constellation remarkable for its relation to an agreeable season. God says to Job, "Canst thou bind the sweet influences of כֹּלָנָה? i.e. Canst thou bind up or refrain the fertility of the earth, for producing fruits and flowers, when כֹּלָנָה appears?" The different significations of this word, both in the Hebrew and Arabic; concur in pointing out the same sense of the term. כֹּלָנָה may be derived from כֹּלָנָה כֹּלָנָה, which, in Hebrew, signifies, "to defirc, or to rejoince." Of all the seasons the spring is the most dearable, and the most productive of delight and joy. If we deduce the word כֹּלָנָה from the Arabic root כֹּלָנָה, or כֹּלָנָה, this characterizes the spring as distinctly as the former. כֹּלָנָה, in Arabic, signifies, "inferior medicum," and "to become warm," Accordingly, the earth, at the approach of spring, begins to become warm, and to open its bosom; this is also the time when the females of most kinds of animals become pregnant. It remains only to know, what was the constellation which in the time of Job introduced the spring; and this, as we have sufficient reason for believing, was the Pleiades. כֹּלָנָה also signifies a "troop, number, or multitude;" and this etymology agrees perfectly well with the Pleiades, on account of the number of stars included in this collection, or in the constellation of the Bull.

The third constellation mentioned by Job is כֹּלָנָה כֹּלָנָה; the root of which word is כֹּלָנָה כֹּלָנָה, which, in Hebrew, signifies, "to be inconstant or changeable:" and in Arabic,
"to be benumbed, to be idle, to be cold." By Kefs, therefore, it is supposed that Job means the Scorpion. God says to Job, "Canst thou loose the bands of Kefal?" i.e. "Canst thou loose and open the earth, which is shut up and benumbed when Kefal appears? Canst thou then make it produce flowers and fruits?" Adverting to the interpretation already given of Kimah, we shall perceive, by the contrived characters which diftinguished them, that they are two constellations of the zodiac, pointing out two very opposite feasons. If by Kimah Job designed the Pleiades, it is not improbable that by Kefal he meant the Scorpion, a constellation opposed to Pleiades by almost one-half of the circuit of the heavens, and which then announced the approach of winter. Accordingly, Allen-Edward still it is now Kefal that star of the first magnitude, known by the name of the Scorpion's heart, or Antares. In his commentary on Job, he thus explains himself: "Kimah," says he, "is the northern stars, and Kefal is a southern star. Kimah produces fruits, which are the delight of man; and Kefal does the contrary. Kimah is a great star, called the Bull's eye, that is to say, Hyades; and Kefal is a great star, called the Scorpion's heart, that is to say, Antares." Rabbi Levi ben Gershom also, in his commentary on Job, that Kefal is one of the southern constellations; and that when the sun enters into the sign where this star is found, the trees can no longer bring forth fruit, on account of the cold which this star brings with it. Kefal has been suppos'd, by some learned commentators and critics, to denote the constellation Orion, which, at the time of its rise, portends clouds and tempests; and they derive it from Κήφας, Kefal, denoting inclemency. See Schultens's Commentary on Job, vol. i. p. 239, &c. vol. ii. p. 1586. Goguet's Origin of Laws, &c. vol. i. Dictt. 3.

In the prophecy of Amos, who is suppos'd to have lived 790 years B.C., we have the following animated exhortation (chap. v. 7, 8.): "Ye who turn judgment into wormwood, and leave off righteousness in the earth: seek him that maketh the seven stars and Orion, and turneth the shadow of death into the morning, and maketh the day dark with night; that calleth for the waters of the sea; and poureth them out upon the face of the earth: the Lord is his name." In this passage, the seven stars and Orion are mention'd as being well known, both by Amos, who was a herdsman of Tekoa, and the common people, to whom this exhortation was addressed; and we may hence infer, that the constellations had been invented for some time before that period. Some of the constellations are also occasionally mentioned by Hefiod and Homor, who flourished about 900 years before Christ; and Aratus of Tarus, the astronomical poet, who lived about 277 years B.C., in his "Phenomena," profec'dly treat'd of them all, except some few which were invent'd after his time; shewing how each constellation is situated with regard to those that are near it, what peculiarion it bears with respect to the principal circles of the sphere; and what other constellations rise or set with it. Hipparchus, the Bithynian, has shewn, that Aratus followed the descriptions of Eudoxus, who flourished about 366 years B.C.; and it is very probable that the Greek astronomers, who succeed'd him continu'd to use the same figures of the constellations till the time of Ptolemy, though not without some variations and additions. Ptolemy's Almagest (see Almagest) has been in such esteem among astronomers, that almost all who have written since his time have agreed in drawing the figures of the constellations, or supposing them to be drawn, so as to answer his description, as far as possible; and indeed this is necessary, in order to avoid confusion, when ancient and modern observations are compared.

The division of the ancients only took in the visible firmament, or so much as came under their notice; this they distributed into forty-eight constellations, those being reckoned ancient constellations which have been received from the Greeks, and particularly from Ptolemy; twelve of these took up the zodiac: the names they gave them are, Arias, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricornus, Aquarius, Pisces; from whence the signs of the zodiac and zodiac take their names; though they have since lost their contiguity to the constellations which denominate them; e. g. the constellation Arias, about 2600 years ago, occupied the place of the first sign of the zodiac; but, on account of the precession of the equinoxes, it is now removed to the second, and so of the others. See Sign.

The other stars, on the northern side of the zodiac, were disposed into twenty-one constellations; viz. Ursa Major and Minor, Draco, Cepheus, Bootes, Corona Septentrionalis, Hercules, Lyra, Cygnus, Cepheus, Perseus, Andromeda, Triangulum, Auriga, Pegasi, Equuleus, Delphinus, Sagitta, Aquila, Ophiuchus or Serpentarius, and Serpens; to which we have since added Antinous, and Cuma Berenices, and some others.

The stars on the southern side of the zodiac were distributed into fifteen constellations: their names are, Cetus, Eridanus, Lepus, Orion, Canis major and minor, Argo, Hydra, Grater, Corvus, Centaurus, Lupus, Ara, Corona Meridinalis, and Piscis Australis; to which we have since added several others, viz. Phoenix, Grus, Indus, Pavo, Apus or Avis Indica, Apsis Mearer, Chamæleon, Trigunum Australis, Piscis volans, Tucan, Hydrus, Xiphias or Dorado, Columba Noctis, and Roros Caroahum, &c. &c. See each constellation under its proper head, Arias, Taurus, &c.

Thus other stars, not comprehended under these constellations, yet visible to the naked eye, the ancients called incolumes, or spies, some of which the modern astronomers have since reduced into new figures, or constellations.

Thus, Hevelius, v. gr. between Leo and Ursa major, makes Leo minor; and between Ursa minor, and Auriga, over Gemini, makes Lynx; under the tail of Ursa major, Comae venatici, Cerberus, Vulpecula, and Antier, Scutum Sobiek, Lacerta, Camelopardalis, Monoceros, and Sextans. See also Antinous, Berenice, and Cor Caroli.

In these constellations, the stars are ordinarily distinguisht by that part of the image wherein they are found. Bayer distinguishes them farther by the letters of the Greek alphabet; and many of them, again, have their peculiar names, as Arcturus, between the knees of Bootes; Gemina, or Lucida, in the Corona septentrionalis; Pollutum, or Aldebaran, in the Bull's eye, Pleiades in the neck, and Hyades in the forehead of the Bull; Castor and Pollux in the heads of Gemini; Capella, with the head; the shoulder of Auriga; Regulus, or Cor Leonis; Spica Virginis in the hand, and Vindemiatrix in the shoulder of Virgo; Aitares, or Cor Serpentis, in the mouth of Piscis; Regis, in the foot of Orion; Siris, in the mouth of Canis major; Ptolemy, in the back of Canis minor; and the Polestar, the last in the tail of Ursa minor.

The knowledge of the stars has become more extensive; the number of constellations has increased; and a greater number of stars has been introduced into each constellation; as their positions, by more accurate observations, have been ascertained.

The following tables exhibit the names of the constellations, and the number of stars in each, including all to the fifth magnitude; and also some of the most remarkable stars in each constellation.
# Constellation

## Table I. Constellations in the Zodiac.

<table>
<thead>
<tr>
<th>Names of Constellations</th>
<th>Number of the Stars</th>
<th>Chief Stars</th>
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</thead>
<tbody>
<tr>
<td>Taurus, the Bull</td>
<td>44</td>
<td>43</td>
</tr>
<tr>
<td>Gemini, the Twins</td>
<td>25</td>
<td>25</td>
</tr>
<tr>
<td>Cancer, the Crab</td>
<td>13</td>
<td>15</td>
</tr>
<tr>
<td>Leo, the Lion</td>
<td>35</td>
<td>30</td>
</tr>
<tr>
<td>Virgo, the Virgin</td>
<td>32</td>
<td>33</td>
</tr>
<tr>
<td>Libra, Chelae, the Scales</td>
<td>17</td>
<td>18</td>
</tr>
<tr>
<td>Scorpio, the Scorpion</td>
<td>24</td>
<td>27</td>
</tr>
<tr>
<td>Sagittarius, the Archer</td>
<td>31</td>
<td>14</td>
</tr>
<tr>
<td>Capricornus, the Goat</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Aquarius, the Water-bearer</td>
<td>45</td>
<td>41</td>
</tr>
<tr>
<td>Piscis, the Fishes</td>
<td>38</td>
<td>36</td>
</tr>
</tbody>
</table>

## Table II. Constellations northward of the Zodiac.

<table>
<thead>
<tr>
<th>Names of the Constellations</th>
<th>Number of Stars</th>
<th>Chief Stars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ursa minor, the Little Bear</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Ursa major, the Great Bear</td>
<td>35</td>
<td>29</td>
</tr>
<tr>
<td>Perseus</td>
<td>29</td>
<td>29</td>
</tr>
<tr>
<td>Auriga, the Waggoner</td>
<td>14</td>
<td>9</td>
</tr>
<tr>
<td>*Bootes</td>
<td>23</td>
<td>18</td>
</tr>
<tr>
<td>Draco, the Dragon</td>
<td>31</td>
<td>32</td>
</tr>
<tr>
<td>*Cepheus</td>
<td>13</td>
<td>4</td>
</tr>
<tr>
<td>*Canes Venatici, V. Alcubrio, et Chara, the Greyhounds</td>
<td>1</td>
<td>-</td>
</tr>
<tr>
<td>*Cor Caroli</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Triangulum, the Triangle</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Triangulum minus</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Musca</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Lynx</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Leo minor, the Little Lion</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Coma Berenices, Berenices' hair</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Camelopardalas</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Mons Menclaus</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Corona Borealis, the Northern Crown</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Serpens, the Serpent</td>
<td>13</td>
<td>13</td>
</tr>
<tr>
<td>Scutum Sobieski, Sobieski's Shield</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Hercules cum Ramo &amp; Cerbero, Hercules, since called Engonasia</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Serpentarius, five Ophiuchus</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>*Taurus Pontiakwski</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Lyra, the Harp</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>*Vulpeculus &amp; Anter, the Fox and Goode</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Sagitta, the Arrow</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Aquila, the Eagle</td>
<td>5</td>
<td>12</td>
</tr>
<tr>
<td>Delphinus, the Dolphin</td>
<td>10</td>
<td>9</td>
</tr>
<tr>
<td>Cygnus, the Swan</td>
<td>19</td>
<td>18</td>
</tr>
<tr>
<td>Cassiopea, the Lady in her chair</td>
<td>13</td>
<td>26</td>
</tr>
<tr>
<td>Equus, the Horse's head</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>*Lacerta, the Lizard</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Pegasus, the Flying Horse</td>
<td>20</td>
<td>19</td>
</tr>
<tr>
<td>Andromeda</td>
<td>23</td>
<td>23</td>
</tr>
</tbody>
</table>

### Table

<table>
<thead>
<tr>
<th>Chief Stars</th>
<th>Mag.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aldebaran</td>
<td>-1</td>
</tr>
<tr>
<td>Castor and Pollux</td>
<td>-2</td>
</tr>
</tbody>
</table>
TABLE III. Constellations southward of the Zodiac.

<table>
<thead>
<tr>
<th>Names of the Constellations</th>
<th>Number of the Stars</th>
<th>Chief Stars</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phoenix</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Officina Sculptoria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eridanus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hydrus, the Waterfowl</td>
<td>34</td>
<td>10</td>
</tr>
<tr>
<td>Cetus, the Whale</td>
<td>22</td>
<td>21</td>
</tr>
<tr>
<td>Fornax Chemica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Horologium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Reticulus Rhomboidalis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Xyphias, the Swordfish</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Celastritellis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Lepus, the Hare</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Columba Noaehi, Noah's Dove</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Orion</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Argo Navis, the Ship</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canis Major, the Great Dog</td>
<td>29</td>
<td>13</td>
</tr>
<tr>
<td>Equuleus Pistorius</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monoceros, the Unicorn</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canis Minor, the Little Dog</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Chamæleon</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pyxys Nautica</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piscis Volans, Paffar, the Flying Fish</td>
<td>27</td>
<td>19</td>
</tr>
<tr>
<td>Hydra</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sextans</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Robur Carolinum, the Royal Oak</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machina Pneumática</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crater, the Cup</td>
<td>7</td>
<td>3</td>
</tr>
<tr>
<td>Corvus, the Crow</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>Crocota, el Cruzero</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apis Musca, the Bee or Fly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apus or Avis Indica, the bird of Paradise</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Circinus, the Compasses</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Centaurus, the Centaur</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Lupus, the Wolf</td>
<td>19</td>
<td></td>
</tr>
<tr>
<td>Quadra Euclidis</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Triangulum Australis, the Southern Triangle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ara, the Altar</td>
<td>7</td>
<td></td>
</tr>
<tr>
<td>Telecopium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corona Australis, the Southern Crown</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pavo, the Peacock</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indus, the Indian</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microcopium</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oëans Hadleianus</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grus, the Crane</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Toucan, the American Goose</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Piscis Australis, the Southern Fish</td>
<td>18</td>
<td></td>
</tr>
</tbody>
</table>

N. B. In the preceding Tables the new Constellations are distinguished from the ancient by a Star, *.
CONSTELLATION.

TABLE IV. Number of Stars of each Magnitude.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Constellations in the Zodiac</td>
<td>12</td>
<td>16</td>
<td>44</td>
<td>120</td>
<td>183</td>
<td>646</td>
<td>1014</td>
</tr>
<tr>
<td>In the Northern Hemisphere</td>
<td>34</td>
<td>24</td>
<td>95</td>
<td>200</td>
<td>291</td>
<td>635</td>
<td>1251</td>
</tr>
<tr>
<td>In the Southern Hemisphere</td>
<td>45</td>
<td>30</td>
<td>84</td>
<td>190</td>
<td>221</td>
<td>323</td>
<td>863</td>
</tr>
<tr>
<td>Total</td>
<td>20</td>
<td>76</td>
<td>223</td>
<td>510</td>
<td>655</td>
<td>1604</td>
<td>3128</td>
</tr>
</tbody>
</table>

There are several ways of delineating the constellations and stars, so that an observer may be able to distinguish them in the heavens. The most eligible method of all is to construct a hollow globe of such a large size as to admit the observer to stand on a frame near its centre; and then to paint the stars and constellations in its inner surface, in their proper situations with regard to one another. If such a globe be elevated according to the latitude, were made to turn on its poles, the observer near the centre would behold the motions and aspects of the stars as they really are in the heavens, and soon obtain a correct idea of the whole. A machine of this kind, however, could not be constructed without a very considerable expense as well as ingenuity. Large machines on this plan have been made at Gottorp, at the expence of Frederick III. duke of Holstein; and at Paris by the direction of cardinal d'Etrees; but these are far inferior in size to one erected at Pembroke college, in Cambridge, under the direction of Dr. Long. The description of this curious machine is here subjoined in the doctor's own words. "I have, in a room lately built in Pembroke hall, erected a sphere of 18 feet diameter, wherein 50 persons may sit conveniently: the entrance into it is on the south pole by six steps:—the frame of the sphere consists of a number of iron meridians, not complete semi-circles, the northern ends of which are screwed to a large round plate of brass with a hole in the centre of it; through this hole, from a beam in the ceiling, comes the north pole, a round iron rod about three feet long, and supports the upper parts of the sphere to its proper elevation for the latitude of Cambridge; the lower part of the sphere, so much of it as is invisible in England, is cut off: and the lower or southern ends of the meridians, or truncated semi-circles, terminate on, and are screwed down to a strong circle of oak, of about thirteen feet diameter, which, when the sphere is put into motion, runs upon large rollers of lignum vitae, in the manner that the tops of some wind-mills are made to turn round. Upon the iron meridians is fixed a zodiac of tin, painted blue, whereas the ecliptic and horizonitic orbits of the planets are drawn, and the constellations and stars traced:—the great and little bear, and Draco, are already painted in their places round the north pole; the rest of the constellations are proposed to follow: the whole is turned round with a small winch, with as little labour as it takes to wind up a jack, though the weight of the iron, tin, and wooden circle, is about a thousand pounds. When it is made use of, a planetarium will be placed in the middle thereof. The whole, with the floor, is well supported by a frame of large timbers." In 1758, the constellations and chief stars visible at Cambridge, were painted in their proper places upon plates of iron joined together, which form one concave surface. We here add with regret, that this curious machine has been much neglected and is so far decayed as to answer none of the purposes which the ingenious contriver proposed. The constellations and stars might also be drawn in two concave hemispheres, which would contain them all, or segments of spheres might be made of brass or plate board, of such dimensions that each segment should contain a single constellation upon its concave surface. Sometimes the constellations are drawn upon two planisphere projected upon a great circle, which give us the pictures of the two concave hemispheres in plane. The constellations and stars may also be depicted on a celestial globe. The first use of all these concave spheres, planispheres, and globes is, by comparing them with the originals, to know the stars in the heavens; but as the rotation of the earth round its axis causes the heaven and stars, &c. apparently to move the contrary way; and thus the sphere of the fixed stars is made to change its position, with respect to us, every moment of the natural day; it will be necessary, in order to compare the stars upon a concave hemisphere, globe, or planisphere, with the stars in the heaven, to place the globe, hemisphere, &c. in such a position as to correspond with the situation of the heavens at the time of observation. The method of rectifying the celestial globe for any hour of the night, or to place it that every star on the globe may point at the corresponding star in the heavens, will be found under the article Celestial Globe; and when this is done, the constellation may be known, by comparing the heavens and the globe with one another. E. G. if I would find a star called Arcturus in the heavens, the globe being rectified for the star Arcturus, then if I imagine a line to be drawn from the centre of the globe through that star, that line continued will point at Arcturus in the heavens. Suppose, on the other hand, I see some bright star in the heavens which I want to find upon the globe, I first rectify the globe for the hour of the night, and then if I imagine a line to be drawn from the star to the centre of the globe, it will point at the corresponding star on the surface of the globe. Maps of the concave surface of the heavens, especially such as take in only one constellation, with some parts of those which surround it, are very useful for the purpose of becoming acquainted with the stars. Of this sort are the figures given by Beyer in his "Uranometria," and those of Flamsteed, published after his death by Hodgson. See our Plates of Constellations. The manner of using these maps will be seen by the following example. If I would know the stars in the Great Bear, I turn the figure about, till the principal stars of it are in the same situation with regard to upper or under, right or left, as they appear in the heavens, at the time of making my observation; when this is done, it is easy to look for the stars on the heavens and then upon the map, to discover to what parts of the figure, whether to the eye, fountain, &c. the rest of the stars are to be referred.

It is very probable that the stars, and more especially some of the most remarkable collections of them, such as Charles's Wain, the Pleiades, Orion, &c. were formed into constellations.
 Constellation.

The Greeks, who learned astronomy of the Egyptians, retained several of their figures, as the ram, the bull, the lion, the dog, the triangle, &c.; but accommodated almost all of them to the fabulous history of their gods and heroes, whom they thus placed among the stars. According to the Greek and also the Roman poets, from the ancient theology, they had given us wild and romantic fables about the origin of the constellations, probably derived from the hieroglyphics of the Egyptians, and transmitted, with some alterations, from them to the Greeks; which may be seen in Hyginus’s Ptolemaic Almanac. and Ricciola’s Almagest, lib. vi. cap. 3, 4, 5; and Sertorius’s notes upon Manlius. Sir Isaac Newton observes, (see his Chronology, apud Oper. vol. v. p. 62.) that the Magnes, one of the Argonauts, was the first among the Greeks who made a sphere; and the sphere itself, he says, shews that it was delineated in the time of the Argonautic expedition; for that expedition is delineated in the Atlantis. Thus we have the golden Ram, the enigma of the veil in which Phryxus fled to Colchis; the Bull with broken hoofs tamed by Jason; and the twins, Castor and Pollux, two of the Argonauts, with the Swan of Leda their mother. We have also the ship Argo, and Hylas the watchful dragon: with Medea’s cup, and a Raven upon its carcase, the symbol of death. We have Chiron the master of Japhet, with his altar and sacrifice; the Argonaut Hercules with his dart and culture falling down, and the Dragon, Crab, and Lion, which he killed; and the Harp of the Argonaut Orpheus. All these, says sir Isaac, relate to the Argonauts. We have also Orion, the son of Neptune, or, as some say, the grandson of Minos, with his Dogs, and Hare, and River, and Scorpion. We have the story of Perseus in the constellations of Perseo, Andromeda, Cepheus, Cygnus, and Cetus; that of Calibos, and his son Arcas; that of Callisto, and her son Arcas; that of Icarus and his daughter Erigone in Bostis, Plutarch, and Virgo. Ursae minor relates to one of the nutres of Jupiter; Auriga to Erechtchous; Ophiuchus to Pherbas; Sagittarius to Caelus the son of the nurse of the Muses; Capricorn to Pan; and Aquarius to Gaumide. We have Ariadne’s Crown, Bellarophon’s Horse, Neptune’s Dolphin, Ganymede’s Eagle, Jupiter’s Goat, with her Kids; Bacchus’s Affer, the Fishes of Venus and Cupid, and their parent the South-fish. These with Delphin are the old constellations mentioned by Aratus; and they all relate, says Newton, to the Argonauts and their contemporaries, and to persons one or two generations older; and nothing later than that expedition was delineated there originally. Anthius and Coma Berenices are novel. Although it be true, as sir Isaac Newton affirms, that none of the figures on this sphere bear relation to any transtition of later date than the Argonautic expedition; yet the great disagreemant that fults among mythologists in their accounts of these figures shews them to be of greater antiquity, and that the constellations were received for some time among the Greeks, before their poets, according to their several fancies, applied them to different fables. See Long’s Astronomy, vol. i. p. 162.

As the stars grouped in our constellations are capable of being reduced to very different figures, those of the Chinese and Japanese are very different from ours; and some superstitious Arabsians, though they received their astronomy from the Greeks, have given some of their constellations different figures; because they thought it unlawful to draw any human figure; and therefore they changed all such on the celestial globe into some other form. Some Christian astronomers, displeased to see the heavens of the fixed stars occupied by the fabulous heathen deities and heroes have proposed,
proposed, from superstitious zeal but without a due regard to the science of astronomy, to introduce a reformation in this respect; and whilst they retained the ancient figures, to refer them to some scripture history. With this view they would have Arius, or the ram, to be a memorial of that which was offered instead of Isaac, Vlgo to represent the blessed Virgin, &c. Thus, venerable Bede, instead of the profane names and figures of the twelve constellations of the zodiac, substituted those of the twelve apostles; whose example being followed by Julius Schillerius, in 1627, he completed the reformation, and gave scripture names to all the constellations in the heavens. Thus, Arius, or the ram, became converted into St. Peter; Taurus, or the Bull, into St. Andrew; Andromeda into the pharmacy of Christ; Lyra into the manger of Christ; Hercules into the Magi coming from the East; Canis Major into David, &c. Weigheus, professor of mathematics in the university of Jena, made a new order of constellations; converting the firmament into a caulis heroidicum; and introducing the arms of all the princes in Europe, by way of constellations. Thus, Ursa Major, he transformed into the elephant of the kingdom of Denmark; the Scutum into the Ruta with arrows of the banner of Saxony; Opibuchus into the cats of Cologne; the Triangle into the comets, which he calls the symbol of artificers; and the Pléiades into the Moxus Pythagorizans, which he calls that of merchants, &c. However, the more intelligent among astronomers never approved of innovation; as leaving no purpose but to introduce confusion into astronomy. The old constellations, therefore, are still retained; both because better could not be introduced, and likewise to keep up the greater correspondence and uniformity between the old astronomy and the new. See Catalogue.

CONFIRMATION is defined by ethical writers to be an excess of horror, owing to the ill government of our admiration and fear; or such an immediate degree of fear as confounds the faculties, and incapacitates a person for confusion and execution. It denotes a strong foreboding of tremendous evils, that are likely to follow misfortunes which have already taken place.

CONSTIPATION, in Medicine, is synonymous with constipation of the bowels, or a retention of the motions beyond the usual period; which likewise implies, in general, a dry and hardened condition of the excrements, and some difficulty in discharging them.

The proximate cause of constipation of the bowels may consist in an unusual flow of the peristaltic motion, or in an obstruction to the passage of the feces, while the proper peristaltic motion continues to propel them. The natural motion of the bowels is considerably different in individuals of different constitutions, and even in the same individuals at different periods: so that it is not easy to say when the peristaltic motion can be considered as preternatural flow, while the general health continues good.

But it is probable that a stool should occur once in 24 hours, in most habits, although there are many persons who retain the feces much longer without inconvenience. Dr. Cullen affirms, that he is clearly of opinion, that every deviation from a diurnal stool is an approach to an unnatural state. The accumulation and induration of the feces in the large intestines not only often produces many diseases in the lower part of the canal, but even occasions disorders in different organs, and deranges the system in general.

The occasional causes of an inefficient peristaltic motion are various. A weakness of the muscular coat of the bowels appears to be, in some cases, the origin of colic, which is then accompanied with other marks of dilatation, and hence colic is not unfrequent in the female sex, who suffer considerable inconveniences from it. A cause of a contrary nature seems likewise to give rise to constipation, namely, a rigour and rigidity of the alimentary canal. In such cases there is necessarily a degree of immobility or torpor, so that the stimuli of the passing feces excites the intestines to less active motions, than in the more irritable habits; at the same time digestion is more perfectly performed, and a smaller proportion of feces therefore is produced: the absorption of the liquid parts too is more complete, and hence the feces are not only smaller, but dryer, and pass less easily. In rigid and robust persons therefore habitual constipation is not uncommon. And in those of hypochondriacal or melancholy habits, a similar torpor in the motions of the whole system, and particularly of the intestinal canal, produces a similar disposition to colic. Another cause of the flow of the peristaltic motion may be a deficiency of the in the intestines, which is considered as one of the principal stimuli in maintaining the motion of the canal downwards. It is not indeed always in our power to alter the occurrence of this phenomenon; but we know, that where the bile is withheld from the intestines, as in jaundice, there is common colic. It is not quite evident in what manner a regular and constant exercise of secretion, as in a carriage, or on the water, produces colic, rather than any considerable bodily activity, which is accompanied by much perspiration; Dr. Cullen is disposed to attribute it to the abstraction of the other intestinal fluids, secreted from the mucous glands and exhalent arteries. See Materia Med. vol. ii. p. 496.

The causes which may obstruct the passage of the fecal matter, occur either in the intestines themselves, or in the neighbouring parts. In the intestines, a mechanical impediment is sometimes occasioned by a thickening of the coats, which straitens the passage, or by chirrous tumours, especially near the lower extremity of the canal. Sometimes the cavity of the intestine is partly filled by calculous concretions. A temporary diminution of the caliber of the canal is also occasioned by spasmatic contractions in the coats, as occurs in coils, or by the occurrence of inflammation, as in enteritis and enteritis, in all of which the feces are retained. Tumours in the neighboring parts, comprizing the intestines, necessarily impede the passage of the contained feces. Hence obstinate constipation has sometimes been occasioned by a fistomatous tumour in the omentum; and a very frequent cause of colic is the compression of the dilated uterus upon the rectum, or lower gut, in pregnant women.

When, from neglect of evacuation, or other circumstances, an accumulation of feces to a considerable extent takes place in the rectum, or lower intestines, this collection of matter itself becomes a cause of a most painful and distressing constipation, attended with peculiar symptoms, and sometimes terminating fatally. This disorder was first described by an anonymous writer in the Medical Observations and Inquiries, vol. iv. p. 123, and other cases have since been recorded by other practitioners. (See Duncan's Medical Commentaries, vol. x. p. 255, and vol. xii. p. 282.) It is the more important to attend to this complaint, because it assumes the appearance of a diarrhœa, or rather a chronic dysenteric, and has been often mistaken for the former, and erroneously treated with astringents and opiates in consequence. The patient complains of severe pain about the lower region of the belly, retchting and again returning after frequent, but short intervals, and accompanied with a perpetual bearing down, and almost continual inclination to evacuate the contents of the intestines; but only a trifling quantity
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When a fresh spasmoidal effort succeeds, and with similar succeess, is considered as a kind of spontaneous emission of all the parts in, or connected with, the pelvis, for the exclusion of this irritating substance. When, from a previous collisence, from the acuteness of the pain and tenesmus (or bearing down), and the obstruction of formed and feculent flouts, this state of the rectum is to be suspected, the gut should be examined per anum, when the faces will be readily detected in general, and must be broken down and removed by the finger, or some other mechanical means. The accumulation, which thus takes place, is sometimes very great. The following account from an apothecary, is given by Dr. Warren of Taunton:—"the evening you left us, I extracted from our patient (a lady, aged 65, who had laboured under this disease for five months,) four large balls of hardened excrementitious matter, about the size of hen's eggs; the next morning the discharged near twenty, and has continued to pass more or less of them every day, until about a week ago, when she took a larger dose than ordinary of caustic oil, which evacuated 19 lumps of the same size as formerly; since that her flux has been natural, none of the balls having appeared." See Duncan's Med. Com. vol. x. p. 259. This disorder is peculiar to persons in advanced life, when a degree of atony often exists in the bowels; and it is more frequently observed in the female, than in the male sex. Whatever tends to lessen the peristaltic motion of the bowels, must induce a predispension to it; and it is said to have been frequently occasioned by a long continued use of bark, opium, and other astringent medicines.

The consequences of a constricted state of the bowels, however, though in a comparatively trivial degree, whether idiopathic, or as a concomitant of other diseases, are frequently extremely injurious to the constitution; producing, when it is idiopathic, a variety of disorders; and aggravating, when symptomatic, the diseases of which it is a symptom.

The stomach and intestines, being a continuation of the same canal, reciprocally affect each other, when diarrhoea. Hence, complaints of the stomach are frequent consequences of colicneses of the bowels; such as flatulence, stomach ache, or gastrodynia, heart-burn, indigestion, &c. Another affection of the canal is frequently produced by complication, namely, the appearance of hemorrhoidal tumours, or piles, at the lower extremity of the rectum, about the anus. See HEMORRHoids. Sometimes, from a sympathy of the head with the stomach, and sometimes probably from the pressure of the loaded intestines on the great veins, impeding the circulation of the blood downwards, and therefore determining it more copiously towards the head, a pain of the head is excited by a constricted condition of the bowels. This head-ache is various in different instances, but most commonly is confined to the forehead, or to the occiput, or nape of the neck: occasionally the hemicrania, or intermitting head-ache, appears to arise from complication. In those whole states predispose them to apoplectic, paralytic, or lethargic attacks, a loaded state of the bowels, by obstructing the circulation downwards, increases the predisposition, and occasionally even becomes the exciting cause of those diseases.

There are, besides, many disorders both acute and chronic, which, although they cannot be said to be produced by conification of the bowels, are nevertheless greatly aggravated by it; and the complication is frequently a leading symptom of these disorders. Thus in all acute febrile complaints, and particularly in idiopathic and eruptive fevers, such as the syphillis, or summer-fever, typhus, scarlet-fever, small-pox, &c. complication is liable to occur, and when occurring at any period of the fever, tends to aggravate its symptoms, and to prolong its duration: and if, on the contrary, the bowels are freely opened in the commencement of these disorders, their severity is mitigated, and their duration frequently abridged. This is more especially the case in syphilis and typhus, and in the febrile complaints of children. In a certain set of chronic diseases, which have heretofore been considered as unconnected with the condition of the bowels, such as many hysterical affections, chlorosis, and particularly chorea, or St. Vitus's dance, complication has lately been shown to be a source of much mischief, if not frequently the exciting cause. (Hamilton on Purges.) See CHOREA, and CATARRHES. In short, a constricted state of the bowels is at all times liable to produce injurious effects on the constitution; in health it is a common exciting cause of various complaints; and in all states of diseases, whether acute or chronic, it tends to aggravate the symptoms, and to prevent the beneficial operation of remedies.

The mode of obviating complication must be varied, according to the nature of the case, and the constitution of the patient. Where it is slight and accidental, any of the milder cathartics, such as magnesia vomita, or Epsom salt, or calomel, or (solem nitr.), rhubarb, or small doses of coloewel, will generally answer the purpose of removing it; if these fail, the more active purgatives must be resorted to, especially in strong habits, such as japa, aloes, extract of cocoynth, coloewel in larger doses, and combined with some of the preceding substances. Coloewel, or the other mild mercures, preparations, appear to be peculiarly useful, when the complication is occasioned by a torpor of the hepatic system, and a consequent deficiency, or morbid change in the quality of the bile, as they appear to stimulate more particularly the biliary ducts and vesicles. The colour and factor of the fluids should be noticed with care, since the quality and condition of the bile, which is the principal colouring matter of the faces, may be thus most clearly ascertained. In acute diseases this observation is more particularly important, as the sensible qualities of the faces frequently indicate a loaded and morbid condition of the alimentary canal, and the necessity of laxatives, when the number of motions does not appear to require such evacuations. See Hamilton: also Abernethy, Surgical Observations, vol. iii.

When complication is habitual, some gently stimulating or cooling laxative, according to circumstances, may be required to be given daily, until the habit be removed. Much may be done for the relief of this by diet; as by eating a large proportion of vegetables, or by the free use of fruits, even those which are dried, or preserved with sugar; and by avoiding such articles as manifestly tend to counteract the body. And the advice of Mr. Locke should be steadily followed; i.e. the patient should go regularly to stool at the same hour daily: for such is the periodical regularity of all the functions of the body, that they are more perfectly performed at the accustomed hours than at any other period. Thus sleep, and the appetite for food, often forsake us altogether, if we delay the gratification beyond the usual hour.

In states of extreme complication it is very common among the vulgar to refer to a medicine which appears to have been first employed from the most absurd and false notions of its powers, namely, crude mercury, or quicksilver. Whether it may have been supposed to open the bowels by some self-
moving power, or by its mechanical weight, the theory is equally absurd: and what is worse, the practice is not only useless, but dangerous. There are cases on record, in which the quicksilver, thus administered, had accumulated in the intestines, formed itself a sac by its weight, and at length produced death, by passing into the cavity of the abdomen, in consequence of the rupture of this sac. It is obvious, indeed, that the medicine could not ever force a passage by its weight, along the course of the bowels, since it must ascend occasionally, if the body is erect; and the whole passage must be nearly horizontal, if the patient be in a recumbent posture.

In the worst degrees of constipation, glibsters consisting of an infusion of tobacco, or the smoke of tobacco, have been thrown into the bowels with advantage. And when all other expeditious means fail, an affusion of quicksilver into the lower extremities, while the patient is placed with his feet on a cold hearth, has been found to excite the propulsion of the faces. See Cole. A glibster consisting of Venice turpentine, suspended in water by means of mucilage, or the yolk of an egg, was a favourite remedy with Dr. Cullen for severe constipation; and it is undoubtedly an efficacious expedient; more especially if administered a few hours after an active cathartic has been taken internally.

Where the constipation is occasioned by a mechanical ob-struction, it can of course be alleviated only by the removal of the obstruction. If it arises from the presence of tumours or concretions external to the bowels, it may be considered as incurable; and can only be alleviated by keeping the bowels lax, and the faces in as liquid a state as possible. Strictures of the lower intestine have been frequently relieved by the introduction of a bongie, mechanically enlarging the passage. An intelligent writer remarks, that "strictures take place in different situations; but they occur so frequently about the sigmoid flexure of the colon, near its termination in the rectum, that this part should be carefully examined in every case of a total obstruction of the bowels."

The infusion of an unyielding tallow candle, though often practised, has been generally found painful and inefficacious. It is requisite for the purpose to employ a bongie thirteen inches long, and of a proportionate strength; which should also be directed, with a nice hand, by a skilful surgeon. "I lately saw a lady," he adds, "thus relieved, who had been twenty-six days without any evacuation from the bowels, and who seemed nearly exhausted by violence of pain, and dilatation of the abdomen, hicoupa, cold sweat, &c. It is remarkable how long patients submit under these distressing circumstances. In one infance the time was twenty-nine days; in another patient thirty-three days. As the latter recovered after enduring every torture such a disorder could inflict, practitioners may be encouraged to persevere steadily in their attentions, and to retain some hopes even in the greatest extremity."

Wllian on Diffeces in London, page 185.

CONSTITUTENT Parts, in Chemy. The constituent parts of bodies are their diminutive parts, or principles, into which they may be resolved, by the rules of that art. They are thus called in distinction from the integrant parts of bodies, which are parts of the same nature and properties with the bodies themselves. Thus quicksilver, dissolved by aqua fortis, may be separated from the diluted menstruum, by means of a copper plate, in its own form; this therefore was only divided into its integrant parts; but cinnabar resolved by chemisty into sulphur and mercury, is divided into its constituent parts, neither of these, nor any particle of them, being cinnabar, or having its properties. Shaw's Lectures, p. 15.

CONSTITUTION, an establishment, ordinance, decision, regulation, or law, made by authority of a prince, or other superior, ecclesiastical or civil.

The constitutions of the Roman emperors make a part of the civil law. The constitutions of the church make a part of the canon law. Some of the papal constitutions are in form of bullis, others of briefs. See each article.

Constitutions of Clarendon. See CLARENDON.

Constitutions, Clementine. See CANON LAW.

Constitutions, Legitime, were ecclesiastical laws enacted in national synods, held under the cardinals Otho and Otho- bon, legates from pope Gregory IX. and pope Clement IV., in the reign of Henry III., about the years 1237 and 1260.

Cardinal Otho arrived in England, as a legate from the pope, in the year 1237, where he continued about three years, receiving many valuable presents from the bishops, monasteries, and clergy. This legate held a council at London, A.D. 1237, in which a great number of canons were framed, which were called "the Constitutions of Otho." These constitutions do not contain many things new or remarkable. By the second canon, the sacraments are declared to be seven in number; the fifteenth is against the clandestine marriages of the clergy; and the sixteenth against their keeping concubines publicly: both which practices were still very frequent in England. This legate convened two other assemblies of the clergy, with no other view but to make exorbitant demands of money. After the restoration of the royal authority, by the victory of Ewelham, the pope sent his legate Othobon into England, who held a national council, A.D. 1268, at St. Paul's in London. In this council many canons were made, much the fame in substance with those of the former council of London, in 1237, under the legate Otho.

Constitutions, Provincial, are principally the decrees of provincial synods, held under several archbishops of Canterbury, from Stephen Langton, in the reign of Henry III. to Henry Chicheley, in the reign of Henry V., and adopted also by the province of York in 1464, under Henry VI.

Constitutions of 1603. See Canon Law.

Constitutions, Apologetical, in Ecclesiastical History, denote a collection of regulations attributed to the apostles, and supposed to have been collected by St. Clement, whose name they likewise bear.

These are divided into eight books; consisting of a great number of rules and precepts, relating to the duties of Christians, and particularly to the ceremonies and discipline of the church.

Mr. Robert Turner, in his "Discourse of the pretended Apologetical Constitutions," maintains, that these eight books seem to have been made out of several doctrines, constitutions, canons, travels, and traditions, ascribed to the apostles, and out of some of the ancient liturgies, and the discipline and practice of the Greek church, only blended together, adulterated, and changed, by some ignorant Arian, in the fifth century. Bishop Pearson was of opinion, that the Apologetical Constitutions were formed out of several lesser works, called Doctrines and Constitutions, and it is to be written by Clement, Ignatius, Hippolytus, and others, but altered and interpolated by the author of this collection; and that the eight books of the Constitutions, as we now have them, were not composed and finishead till after the time of Epiphanius.

Authors, however, are divided about the genuineness of these Constitutions: the generality hold them spurious, and endeavour to prove them posterior to the apostolic age; maintaining they were unknown till the fourth century; 5 R which,
which, if this be the fact, shews, that St. Clement had no concern in them. It is certain, that no such book is quoted as Scripture by any Christian writer of the three first centuries. The first who citing a work under this title is Epiphanius, and yet he speaks of it as of doubtful authority; and some modern writers are of opinion, that the Constitutions quoted by Epiphanius were different from the present Constitutions. When he says, that it was "doubted by many," he himself intimates, that some suspected it to be the work of some heretic; in opposition to which he says, it ought not to be rejected, as, from its contents, it appeared to be the work of some honest, orthodox, or Catholic Christian.

It is not easy to say, what respect Epiphanius himself had for this work. He quotes things from it as ordinances of the apostles, and as the divine word or doctrine; but it is not mentioned in any of the passages, where he gives the catalogues of the books of Scripture. Besides, his expressions just taken notice of seem to imply no more, than that the book was an ecclesiastical or orthodox writing; and we may observe farther, either that his Constitutions were not the same as ours, or that he had no great regard for them. For in our Constitutions, several early heretics are named, and they are condemned and confuted; of which passages, nevertheless, Epiphanius has made no use in his history of those heretics, or in his arguments against them; which every one must think he would have done, if the Constitutions which we have had been then in being, and had been esteemed by him as of authority. Whatever might be his opinion concerning this work, we have no good reason for supposing that it was a book of sacred Scripture; because no such book is quoted as Scripture by Irenæus, Clement of Alexandria, Origen, Cyprian, Eusebius, or any other Christian writer of the first three centuries. It is more than probable that the eight books, as we have them, were not composed and finished till after the time of Epiphanius, towards the middle, or before the end, of the fifth century. Cotelarius (Ap. Pat. Apoll. t. r.) says, it is certain, that the work of the Apostolical Constitutions, in eight books, is apocryphal and pseudepigraphal, not composed by the apostles, nor by the apostolic Clement. Tülemont concours in opinion with Cotelarius. Dailé thinks, that the Constitutions were composed after the council of Nice, and before the end of the fifth century; and bishop Pecior supposes, that the eight books of the Constitutions, as we have them, were not composed and finished till after the time of Epiphanius. Le Clerc mentions some things in the Constitutions exceedingly unfitting to the character of the apostles of Christ; and says, that they well represent the ecclesiastical discipline of the fourth century, but not of earlier times. He thinks, they were composed by some Arian of the fourth century; and seems to imagine, there may be some probability in the conjecture of another learned man, viz. Thomas Bruno or Brown, that they are the work of Leontius, bishop of Tripoli in Lydia.

Mr. Whiston has ventured to oppose the general opinion; and with some reason, much learning, and more warmth, affented the Apostolical Constitutions to be one of the sacred writings, dictated by the apostles in their meetings, written down from their mouths by St. Clement, and intended as a supplement to the New Testament; or, rather, as a scheme and synod of Christian faith and polity. See his Essay on the "Apostolical Constitutions," and his historical preface; wherein the several steps he made in his fancied discovery are traced.

Dr. Lardner, after citing several opinions of learned men concerning this work, offers his own sentiments in his usual judicious and impartial manner. In his investigation of its contents and authority, he observes, that the whole of the work, and all the ordinances in it, from beginning to end, are delivered in the name of all Christ's apostles, and as from God himself; and moreover, that they assume not only the names of the apostles, but also their characters and actions. Hence, according to the whole tenor of the work, they are rightly termed "Apostolical." Dr. Lardner next proceeds to inquire, both from external testimony and internal evidence, how far the authority claimed by these constitutions, and by the advocates of their antiquity, is well founded. To this purpose he observes, that Dâlle, after having examined all the several ecclesiastical writers of the first three centuries. Barnabas, Clement of Rome, Justini Martyr, Athenagoras, Irenæus, Clement of Alexandria, Tertullian, Origens, Cyprian, Dioniynus, Peter of Alexandria, and some others, has shewn, with great probability, that the constitutions were unknown to all these writers. In this opinion Mr. Turner, already cited, concurs. Moreover, the constitutions contain a long history of Simon Magus, and an account of divers other heretics, such as Cleobinus, Dorotheus, the Ebionites, Cerinthus, Marc, Menander, Balsides, Saturninus, the Nicolaitans, and Heterobaptists. The evil of heresies is shewn; the canons of them are ascertained and enumerated; they are condemned and confuted. Neverthelesse, no notice is taken of all this by Irenæus, Tertullian, Clement of Alexandria, or Eusebius; nor even by Epiphanius; though it would have been much more to their purpose. In short, says Dr. Lardner, they could not have omitted it in their censures of the ancient heresies, or in their arguments against them, if they had been acquainted with it; for, certainly, the express authority of the apostles would have been of great advantage to them. As to Clement of Alexandria, though he quotes Clement of Rome, Barnabas, and other Christian authors, and had many occasions for quoting the constitutions, if he had been acquainted with them, yet he does not make the least notice of them. Besides, the constitutions absolutely forbid the reading of heathen authors; nevertheless, the fore-mentioned Clement, who was himself a man of extensive reading, and a great master of heathen learning, frequently cites in his works all sorts of authors, and has recommended the reading of heathen authors, and the study of philosophy; which he would not have done, if he had been acquainted with these constitutions, and had acknowledged them to be apostolical. Tertullian, Origen, and many more justify and recommend the reading of heathen compositions, which could not have been the case, if in doing this they would have violated an apostolical constitution. If, indeed, there had been a constitution of the Christian church, which forbade the reading of such books, the emperor Julian would have had no occasion to make the same prohibition. In the third century a dispute occurred about baptism; in which Cyprian and the African bishops maintained against Stephen bishop of Rome, that the baptism of heretics was null and void, and therefore that those who came over from them were to be re-baptized; this controversy is decided in the constitutions negatively to the judgment of Cyprian and his colleagues; and yet it was not appealed to at that time, because, probably, it was not then extant. Dionylius, who was bishop of Alexandria about the year 248, appears to have been altogether unconvinced with our apostolical constitutions. When a controversy occurred about the time of keeping Easter, which commenced in the second century, and lasted till the fitting of the council of Nice, no appeal was made to the constitutions, which would have served to decide the dispute, if they had actually existed or had been received as apostolical. If an appeal be made to the writers of the fourth and the former part of the fifth century, such as Gregory Nazianzen, Eust., Chrysto-
CONSTITUTION.

ton, the Cyril of Jerusalem and Alexandria, Jeron, Augustine, &c.; they give us no intelligence concerning the apotolical constitutions; having neither cited nor mentioned them in any of their writings. The first (Epiphanius excepted) who has mentioned them, as divided into several books, is the author of the imperfect work upon St. Matthew, probably a Latin writer, and plainly an Arian, who wrote some time after the reign of Theodosius the Great; probably not till after the end of the fifth century. Upon the whole, the constitutions are destitute of all external evidence, that should entitle them to the character of apostolical. As to the internal evidence, they evidently bear many marks of a later age than that of the apostles, and unsuitable to their character. Their manner of quoting the books of the New Testament does not suit the apostles, of which Dr. Lardner has given several instances; many things occur in these books, that refer to a later period than that of the apostles: e. g. they mention several heretics, as we have already observed, that did not appear before the end of the apotolical age; they also record various circumstances, which seem to shew, that the reign of heathenism in the Roman empire had terminated, and that Christians enjoyed ease and prosperity; and they write in a style, make use of terms and appellations, and refer to practices and observances, and offices of the church, which did not obtain till a much later period than the age of the apostles. Several things in the constitutions appear to be unworthy of the apostles of Christ; of which numerous instances are cited by Dr. Lardner, and also by Dr. Jortin, ubi infra. Moreover, this work is not free from incongruities, which are a disparagement to any writings, and they use a mode of expression that betrays a later time than is pretended. From a recital and ample illustration of the several particulars, above cursorily mentioned, by the two learned writers already named, and of others which our limits will not allow us to introduce, we may justly conclude, that the constitutions, in eight books, are not a work of the apostles, and since they bear their names without sufficient authority, they must be referred to the class of impostures. Although the exact time when this work was composed, cannot be determined, and learned men have offered various conjectures, Dr. Lardner inclines to the opinion of those, who think that it was composed in the latter part of the fourth, or the beginning of the fifth century. "The author," probably, says Dr. Lardner, "was a bishop of a proud and haughty spirit, who was fond of church-power, and loved pomp and ceremony in religious worship." To this purpose Dr. Jortin says, that the constitutions repeatedly assert, "that a bishop is a God, a God upon earth, and a king, and infinitely superior to a king, and ruling over rulers and kings. They command Christians to give him tribute as to a king, and to reverence him as a God, and to pay him tithes and first-fruits, according, say they, to God's command; and they strictly forbid Christians to make any inquiry, and to take any notice, whether he dispoe of these revenues well or ill." Sentiments thefe which seem to have been dictated at a time when there were Christian emperors.

Many learned moderns, says Dr. Lardner, "think the author was an Arian; but I do not concern myself about that: the palleges, which have been suppos'd to favour Arianism, make a very small, or no part of the preceding collections; I have no reason, therefore, to bring that point into the conclusion. But I presume, that none ever suspected the author to be a Homoufian." The author of this work, however he was, bears testimony to the feriptures; and appears to have received all these books of the New Testament, which were all along generally received by Christians. Lardner's works, vol. iv. part 2. ch. 35. p. 320—334. Jortin's Remarks on E. H. vol. i. p. 228—278.

CONSTITUTION, in a Physical Sense, is used to denote the general condition of the body, as evinced by the peculiarities in the performance of its functions: such are, the peculiar pre-disposition to certain diseases, or liability of particular organs to disease: the varieties in digestion, in muscular power and motion, in sleep, in the appetites, &c. &c. Some marked peculiarities of constitution are observed to be accompanied with certain external characters, such as a particular colour and texture of the skin, and of the hair, and also with a peculiarity of form and disposition of mind; all of which have been observed from the earliest times, and divided into classes, which have received names, during the prevalence of the humoral pathology, which they still retain, in consequence of the neglect of this important study by modern physicians. See Temperament.

CONSTITUTION, in Political Economy, is frequently used in common language as synonymous with government; but the constitution and the government of a country have different meanings, and are actually distinguished by accurate writers. "By constitution we mean," says lord Bolingbroke, in his "Disquisition on Parties" (Works, vol. ii. p. 130.), "whenever we speak with propriety and exactness, that amalgam of laws, institutions, and customs, derived from certain fixed principles of reason, directed to certain fixed objects of public good, that compose the general system, according to which the community hath agreed to be governed. Whereas by government we mean, whenever we speak in the same manner, that particular tenor of conduct which a chief magistrate, and inferior magistrates under his direction and influence, hold in the direction of public affairs." (See Government.) Constitution, says the same writer, in reference to our own country, is the rule by which our princes ought to govern at all times: government is that by which they actually do govern at any particular time. One may remain immutable; the other may, and as human nature is constituted, must vary. One is the criterion by which we are to try the other; for surely we have a right to do so, since, if we are to live in subjection to the government of our kings, our kings are to govern in subjection to the constitution; and the conformity or non-conformity of their government to it prescribes the measure of our submission to them, according to the principles of the revolution, and of our present settlement, in both of which, though some remote regard was had to blood, yet the preservation of the constitution manifestly determined the community to the choice then made of the persons who should govern. In order further to evince the difference between the constitution and the government of a country, lord Bolingbroke observes that "kings have may have preceded lawgivers, for ought I know, or have possibly been the first lawgivers, and government by will have been established before government by constitution. Theseus might reign at Athens, and Eurytion at Sparta, long before Solon gave laws to one, and Lycurgus to the other of these cities. Kings had governed Rome, we know, and confuls had preceded kings, long before the decemvirs compiled a body of law; and the Saxons had their monarchs before Edgar, though the Saxons laws went under his name." These examples plainly prove, "that however men might submit voluntarily in the primitive simplicity of early ages, or be subjected by conquest to a government without a constitution, yet they were never long in discovering, that (as Hooker observes, Eccle. Pol. i. § 10.) "to live by one man's will became the case of all men's misery," and therefore "they soon rejected the yoke."

or
or made it fit easy on their necks." By the constitution of a country, says archdeacon Paley (Princ. of Moral and Political Philos. vol. ii. chap. 7.), is meant so much of its law, as relates to the designation and form of the legislature; the rights and functions of the several parts of the legislative body; the construction, office, and jurisdiction of courts of justice. Accordingly, the constitution is one principal division; it is the title to the code of public laws; distinguished from the rest only by the inferior importance of the subject of which it treats: and therefore the terms constitutional and unconstitutional, mean legal and illegal. In England the system of public jurisprudence is made up of acts of parliament, of decisions of courts of law, and of immemorial usages: consequently, these are the principles of which the English constitution itself consists; the sources from which all our knowledge of its nature and limitations is to be deduced, and the authorities to which all appeal ought to be made, and by which every constitutional doubt and question can alone be decided. This plain and intelligible definition will serve to discover the error of those writers who absurdly confound what is constitutional with what is expedient, and what is unconstitutional with any measure which they may judge in any respect to be detrimental or dangerous; and also of others, who ascribe a kind of transcendent authority, or mysterious sanctity, to the constitution, as if it were founded in some higher original truth, which gives force and obligation to the ordinary laws and statutes of the realm, or were inviolable on any other account than its intrinsic utility. An act of parliament, in England, can never be unconstitutional, in the strict and proper acceptation of the term; but in a lower sense it may, viz. when it militates with the spirit, contradicts the analogy, or defeats the provision of other laws, made to regulate the form of government. Most of these, says our author, who treat of the British constitution, consider it as a scheme of government formerly planned and contrived by our ancestors, in some certain era of our national history, and as set up in pursuance of such regular plan and design. This is intimated in the expressions of those who speak of the "principles of the constitution," of bringing back the constitution to its "first principles," of referring it to its "original purity," or "primitive model." This, in his opinion, is an erroneous conception of the subject. No such plan was ever formed: consequently no such first principles, original model, or standard exit; that is, as he conceives, there never was a date, or point of original institution, at which the government of England was to be set up anew, and when it was referred to any single person, or assembly, or committee, to frame a charter for the future government of the country; or when a constitution, so prepared and digested, was by common consent received and established. The great charter, and the bill of rights, were wise and laborious efforts to obtain security against certain abuses of regal power; by which the subject had been formerly aggrieved; but these were, either of them, much too partial modifications of the constitution to give it a new original. The constitution of England, like that of most countries in Europe, hath grown out of occasion and emergency; from the fluctuating policy of different ages; from the contentions, successes, interludes, and opportunities of different orders and parties of men in the community. It resembles one of those old manor-houses, which, instead of being built all at once, after a regular plan, and according to the rules of architecture, at present established, has been reared in different ages of the art, has been altered from time to time, and has been continually receiving additions and repairs suited to the taste, fortune, or convenience of its successive proprietors; to such a building we look in vain for the elegance and proportion, for the just order and correspondence of parts, which we expect in a modern edifice; and which external symmetry, after all, contributes much more perhaps to the amusement of the beholder, than the matter of which the building is made.

Some of our approved historians, and political writers, have discovered, as they conceive, the origin of the British constitution in the government of the Anglo-Saxons, brought hither from Germany and the northern countries. To this purpose, it is alleged, that the government of the northern nations, which extinguished themselves on the ruins of Rome, was always extremely free; and that the free constitutions then introduced, however impaired by the encroachments of preceding princes, still preserve an air of independence and legal administration, which distinguish the European nations; and if this part of the globe maintains sentiments of liberty, honour, equity, and valour, superior to the rest of mankind, it is said to have owed these advantages chiefly to the seeds implanted by the generous barbarians of the north. The Saxons who subdued Britain in the 5th century, as they enjoyed great liberty in their own country, obstinately retained that invaluable possession in their new settlement; and they imported into this island the same principles of independence, which they had inherited from their ancestors. The Saxons, as they were early kings, and perhaps more properly than kings or princes, who commanded them in their military expeditions, still possessed a very limited authority; and as the Saxons exterminated, rather than subdued, the ancient inhabitants; they were indeed transplanted into a new territory, but preserved, without alteration, all their civil and military institutions. Their manners and customs were wholly German; and the same picture of a fierce and bold liberty, which is drawn by the masterly pencil of Tacitus, will suit those founders of the English government. The king, so far from being involved with arbitrary power, was only considered as the first among the citizens; and his authority depended more on his personal qualities, than on his station. The Anglo-Saxons, being an independent people, little restrained by law, and cultivated by science, were not very strict in maintaining a regular succession of their princes. Although they paid great regard to the royal family, and ascribed to it an undoubted superiority, they either had no rule, or none that was distinctly observed, in filling the vacant throne; and prefert convenience, in that emergency, was more attended to than form. In other words, however, to suppute, that the crown was considered as altogether elective; and that a regular plan was traced by the constitution for supplying, by the suffrages of the people, every vacancy made by the demise of the first magistrate. All the changes which occurred in the royal succession, and indeed the ordinary administration of government, required the express concurrence, or at least the tacit acquiescence of the people. *The Anglo-Saxon monarchies were not, strictly speaking, either elective or hereditary; and though the deification of a prince might often be followed in appointing his successor, they could not be regarded as wholly testamentary. The rites by which their succession might sometimes establish a sovereign; but they more frequently recognized the person whom they found established. Our knowledge of the Anglo-Saxon history is so imperfect, that it is not easy to ascertain all the prerogatives of the crown and privileges of the people, or to give an exact delineation of that government. It is probable, that the constitution might be somewhat different in the different kingdoms of the HEEPTARCHY, and some occurred, for example, during the course of six centuries, which elapsed from the first invasion of the Saxons, till the Norman conquest. It appears, however, that at all times,
times, and in all the kingdoms, there was a national council, called a wittenagemot, or assembly of the wise men, as the import of those words, and thus was required for enacting laws, and for ratifying the chief acts of public administration. The preambles to all the laws of Ethelbert, Ina, Alfred, Edward the Elder, Athelstan, Edmund, Edgar, Ethelred, and Edward the Confessor; even those to the laws of Canute, though of a kind of conqueror, supply unquestionable proofs every where of a limited and legal government. But who were the constituents, members of this wittenagemot, is a question that has not been determined, in the continuance of antiquity. (See WITTENAGEMOT.) Nevertheless, it is certain, that whatever we may determine concerning the wittenagemot, in whom, with the king, the legislature reposed, the Anglo-Saxon government, in the period preceding the Norman conquest, was become extremely aristocratical; the royal authority was very limited; and the people, even if admitted to that assembly, were deemed of little or no importance and consideration. Upon the whole, notwithstanding the seeming liberty, or rather licentiousness, of the Anglo-Saxons, the great body even of the free citizens, in those ages, really enjoyed much less true liberty, than where the execution of the laws is the most severe, and where subjects are reduced to the strictest subordination and dependence on the civil magistrate. But though the general strain of the Anglo-Saxon government seems to have become aristocratical, there were considerable remains of the ancient democracy, which, though insufficient to protect the lowest of the people, without the patronage of some great lord, might nevertheless give security, and some degree of dignity, to the gentry or inferior nobility. The administration of justice, in particular, by the courts of the deanery, the hundred, and the county, was well calculated to defend general liberty, and to restrain the power of the nobles. The county courts, in particular, where all the freeholders were admitted, formed a wide basis for the government, and furnished considerable checks on the aristocracy. However, the great influence of the lords over their slaves and tenants, the chivalry of theburghers, the total want of a middle class of men, the extent of the monarchy, the loose execution of the laws, and the continued disorders and convulsions of the state, sufficiently evince, that the Anglo-Saxon government became at last extremely aristocratical; and the events, during the period immediately preceding the conquest, confirm this inference or conjecture. If we direct our views to a period much more ancient than that of the establishment of the Anglo-Saxon government, and prior to the invasion of the Romans, we shall find that the governments of the Britons, who were divided into many small nations or tribes, though monarchical, were free, as well as those of all the Celtic nations; and the common people seem to have enjoyed more liberty among them, than among the nations of Gaul, from whom they were defended.

Other writers have maintained, that the government, established by the Anglo-Saxon princes, had little more affinity with the present constitution, than the general relation common indeed to all the governments founded by the northern nations, that of having a king and a body of nobility; and the ancient Saxons government is said to be "left us in flory," (according to the statement of Sir William Temple—Int. to the Hist. of England,) but like to many antique, broken, or defaced pictures, which may still represent something of the costume and fashions of those ages, though little of the true lines, proportions, or resemblance. According to these writers, it is at the era of the conquest, that we are to look for the real foundation of the English constitution. From that period, says Spelman, "novus feclorum nascitur ordo." William of Normandy, it is said, having defeated Harold, and made himself master of the crown, subverted the ancient fabric of the Saxon legislation; he extinguished, or expelled, the former occupiers of lands, in order to distribute their posessions among his followers, and established the feudal system of government, as better adapted to his situation, and indeed the only one of which he possessed a competent idea. A division, however, ought to be made between the government of William 1., which was very tyrannical, and the constitution established under him in the kingdome, which was no absolute monarchy, but an ingratiation of the feudal tenures and other customs of Normandy upon the ancient Saxon laws of Edward the Confessor. He more than once swore to maintain those laws, and in the 4th year of his reign, confirmed them in parliament; yet not without great alterations, to which the whole legislature agreed, by a more complete introduction of the strict feudal law, as it was practised in Normandy.

But that the liberty of the subject was not destroyed by these alterations to the degree which some writers have supposed, plainly appears, says lord Lyttelton, (Hist. Henry 11. vol. 1. p. 59,) by the very statutes which William enacted; in one of which we find an express declaration, "that all the freemen in his kingdom should hold and enjoy their lands and possessions free from all unjust exactions and from all tallage; so that nothing should be exacted or taken of them but their free service, which they by right owed to the crown, and were bound to perform." It is further said, "that this was ordained and granted to them as an hereditary right for ever, by the common council of the kingdom; which very remarkable statute is judically styled by a learned author (Nathaniel Bacon) the first Magna Charta of the Normans; and it extended no less to the English than to the Normans. But it was ill observed by William, who frequently acted as if his will had been the only law to both nations. It must be allowed, that by the interposition of many Mefhe Lords between the crown and the people, and by many offices of judicature and military command being rendered hereditary, which under the Saxons had been either elective, or granted for a short time, the constitution became more aristocratical than before, more unequally balanced, and, in some respects, more oppressive to the inferior orders of freemen. Nor was the condition of the nobles themselves to be envied. For there were certain burthens annexed to their system of fefts, which, as they naturally grew out of that policy, were imposed on the highest vassals as well as on the lowest, and were more grievous than any which the Saxons had borne under their constitution. In process of time the excessive power arrogated and exercised by the king contributed to establish and guard the freedom of the British constitution; because this excess gave rise to the spirit of unity and of concerted resistance. Possessed of extensive domains, the king found himself independent; and vested with the most formidable prerogatives, he cruised at pleasure the most powerful barons in the realm. It was, therefore, only by close and numerous confederacies that those barons could reftift the tyranny of the sovereign; and for this purpose they were constrained to associate the people with themselves, and to render them partakers of public liberty. As acts and inftances of tyranny on the part of the conqueror were multiplied, the confederacies of the barons and of their vassals became more general and more vigorous; and the people at large, instructed and inflamed by their leaders, riangled conditions for themselves, and insisted that, for the future, every individual should be intitled to the protection of the whole.
COnstitution.

The authors, with which the lords had prevailed, in order to oppose the tyranny of the crown, become a bulwark, which was, in time, to restrain their own. It was in the reign of Henry I., about forty years after the conquest, that the operation of these causes produced effect. As the nation had resolved to bfe the crown on a prince, who should acquire and hold it under no other claim than a contract with his people, the title of the king became thus a kind of security for the liberty of the subject. In order to give that liberty a more solid and lasting establishment, they demanded a charter; which Henry granted soon after his coronation, as he had sworn to do before he was crowned. By this he restored the Saxon laws which were in use under Edward the Confessor, with such alterations, or (as he styled them) conditions, as had been made in them by his father with the advice of his parliament; at the same time annulled all civil suffrages, and illegal sanctions, by which the realm had been unjustly oppressed. Some of these grievances were specified in the charter, and the redress of them was there expressly enacted. It also contained very considerable mitigations of those feudal rights claimed by the king over his tenants, and by them over theirs, which were either the most burdensome in their own nature, or had been made so by an abusive extension. In short, all the liberty, that could well be consistent with the safety and interest of the lord in his fief, was allowed to the vassal by this charter, and the profits due to the former were settled according to a determined and moderate rule of law. "This," says Sir Henry Spelman, "was the original of king John's Magna Charta, containing most of the articles of it, either particularly expressed or in general, under the confirmation it gives to the laws of Edward the Confessor." These are therefore much mistaken, who have supposed all the privileges granted in Magna Charta were innovations extorted by the arms of rebels from king John; a notion which seems to have been first taken up, not so much out of ignorance, as from a baseless abuse of adulation to some of our princes in later times, who, endeavouring to grasp at absolute power, were deftions of any pretension to consider those laws, which flowed in their way, as violent encroachments made by the barons on the ancient rights of the crown; whereas they were in reality restitutions and sanctions of ancient rights enjoyed by the nobility and people of England in former reigns; or limitations of powers which the king had illegitimately and arbitrarily stretched beyond their due bounds. In some respects, says Lord Lyttleton, this charter of Henry I. was more advantageous to liberty than Magna Charta itself. Henry II. in a parliament held in London, A.D. 1155, granted a charter of liberties confirming that of his grandfather, Henry I., already mentioned. In consequence of the legal rights established by his excellent prince and the mixture of Saxon customs, which mitigated and tempered the Norman institution, the constitution of England was the best feudal system subsisting at that time, in any part of the world. The honour of establishing in the English constitution itself several judges belongs to Henry II., by whom this institution was revived and regularly settled in the 22d year of his reign, with the advice and concurrence of his parliament held at Northampton. The extension of trials by juries to civil cases may also be well esteemed a principal glory of this reign. Although some vestiges of that method of trial appear among the Anglo-Saxons; yet Spelman says, that the use of trials by 12 men before the conqueror was rare, and did not prevail in any great degree, till the reign of Henry II. (See JURY and Grand Assize.) The debilitated reign of King John excited through the kingdom a general confluence against him and constrained him, A.D. 1215, to sign the famous deed, commonly called the great charter or Magna Charta, which either granted or secured very important liberties and privileges to every order of men in the kingdom; to the clergy, to the barons, and to the people. (See Magna Charta.) This charter, the rigour of the feudal laws was greatly mitigated in favour of the lords; and conditions were also stipulated in favour of the numerous body of the people, who had concurred to obtain it, and who claimed, with sword in hand, share in that security which it was designed to establish. This charter was confirmed in parliament by king Henry III., A.D. 1217, with the addition of some articles to prevent the oppressions by sheriffs; and also with an additional charter of forests. Accordingly, these famous charters have sufficed nearly in their original form, during many generations, as the peculiar favourites of the English nation; and they have been justly esteemed as the most sacred rampart to national liberty and independence. As they secured the rights of all orders of men, they were anxiously defended by all, and became the basis, in a manner, of the English constitution, and a kind of original contract, which both limited the authority of the king, and enforced the conditional allegiance of his subjects. King Edward I. who made it a rule in his own conduct to observe, except on extraordinary occasions, the privileges secured to the barons by the great charter, acquired a right to inflict upon their observance of the same charter towards their valets and inferiors. By the statute (25 Edw. I.) called Confirmatio Charteratum, (the confirmation of which was renewed eleven times in the course of his reign,) he directed the great charter to be allowed as the common law; all judgments contrary to it are declared void; copies of it are ordered to be sent to all cathedral churches, and read twice a year to the people; and mention of excommunication is directed to be as constantly denounced against all who by word, deed, or counsel act contrary to it, or in any degree infringe it. He also, in the statute De Tollagio non Concedendo, (24 Edw. I.) decreed, that no tax should be laid, nor impost levied, without the joint consent of the lords and commons. This important statute, in conjunction with Magna Charta, forms the basis of the English constitution. Under Edward II., the commons, feeling their importance, began to annex petitions to the bills by which they granted subsidies; and this was the dawn of their legislative authority. Under Edward III., they declared they would not, in future, acknowledge any law to which they had not expressly assented. Soon after this, they exercised a privilege, in which consists, at this time, one of the great balances of the constitution: they impeached, and procured to be condemned, some of the first ministers of state. Under Henry IV., they refused to grant subsidies before an answer had been given to their petitions. In a word, the fundamental articles of our free constitution have been affirmed and confirmed by a multitude of statutes, (for Coke is said to reckon thirty-two,) from Edward I. to Henry IV. Then, after a long interval, they were corroborated by the petition of right, which was a parliamentary declaration of the liberties of the people, assented to by king Charles I., in the beginning of his reign. This famous act was soon followed by the still more ample concession made by that unhappy prince to his parliament, before the fatal rupture between them; and by the many salutary laws, particularly the habeas corpus, passed under Charles II. To these succeeded the bill of rights, or declaration delivered by the lords and commons to the prince and princes of Orange, 13th February, 1688; and afterwards enacted in parliament,
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ment, when they became king and queen; which declaration terminates with these remarkable words: 'And they do claim, demand, and inflict upon, all and singular, the premisses, as their undoubted right and liberties.' And the act of parliament itself (W. & M. it. 2. c. 2.) recognizes all and singular the rights and liberties, alleged and claimed in said declaration, to be the true, ancient, and indefeasible rights of the people of this kingdom. 'The Revolution of 1688 may, therefore, be justly deemed the third grand epoch in the history of the English constitution. The great charter had marked out the limits within which the royal authority ought to be confined; some outworks were raised in the reign of Edward I.; but it was at the Revolution that the circumvallation was completed. 'It was at this era,' says De Lomme, 'that the true principles of civil society were distinctly specified and fully established. By the expulsion of a king, who had violated his oath, the doctrine of Resistance, that ultimate resource of an oppressed people, was confirmed beyond a doubt. By the exclusion of a family, heretofore depotist, it was finally determined, that nations are not the property of kings. The principles of Passive Obedience, the divine and indefeasible right of kings; in a word, the whole seculifying of false and superstitious notions, by which the royal authority had till then been supported, fell to the ground; and in the room of it were substituted the more solid and durable foundations of the love of order, and a sense of the necessity of civil government among mankind.' The liberty of the press, the balance and guard of a free constitution, was properly speaking, established four years afterwards, in consequence of the refusal of the parliament to continue any longer the restrictions to which it had before been subject. Finally, the liberties of the British constitution were again asserted at the commencement of the last century, in the act of settlement, (12 & 13 W. III. c. 2.) by which the crown was limited to his present majesty's illustrious house; and some new provisions were added, at the same fortunate era, for better securing our law, religion, and liberties, which the statute declares to be 'the birth-right of the people of England,' according to the ancient doctrine of the common law.

The distinguishing excellence of the British constitution, which has been sometimes called a mixed government, and sometimes a limited monarchy, consists in its being formed by a combination of the three regular species of government, viz. the monarchy, refining in the King; the aristocracy, in the House of Lords; and the democracy or republic being represented by the House of Commons. To this purpose Cicero declares himself of opinion, (in his Fragments, de rep. l. 2.) 'esse optimi constitutum rempublicam, quae ex tribus generibus illis, regali, optimo, et populari, sit mollici confusa.' As the executive power of the laws, in the British constitution, is lodged in a single person, they have all the advantages of strength and dispatch; which are to be found in the most absolute monarchy: and as the legislature of the kingdom is entrusted to three distinct powers, entirely independent of each other; and as this aggregate body, actuated by different springs, and attentive to different interests, composes the British parliament, and has the supreme dispensation of every thing; no inconvenience can be attempted by either of the three branches, which will not, according to the theory of the constitution, be withstood by one of the other two: each branch being armed with a negative power, sufficient to repel any innovation which it shall think inexpedient or dangerous. Whereas, if the supreme power were lodged in any one of the branches separately, we must be expostulated to the inconveniences of either absolute monarchy, aristocracy, or democracy; and to want two of the three principal ingredients of good polity, either virtue, wisdom, or power. If it were lodged in any two of the branches, e. g. in the king and house of lords, our laws might be providently made, and well executed, but they might not have always the good of the people in view: if lodged in the king and commons, we should want that circumvolution and meditatory caution, which the wisdom of the peers is to afford: if the supreme rights of legislature were lodged in the two houses only, and the king had no negative on their proceedings, they might be tempted to encroach upon the royal prerogative, or perhaps to abolish the kingly office, and thereby weaken (if not totally destroy) the strength of the executive power. But the constitutional government of this island is so admirably tempered and compounded, that nothing can endanger or hurt it, but destroying the equilibrium of power between one branch of the legislature and the real. For if events should happen, that the independence of any one of the three should be lost, or that it should become insufficient to the views of the other two, there would soon be an end of our constitution. The legislature would be changed from that, which (upon the supposition of an original contract, either actual or implied) is presumed to have been originally set up, by the general consent and fundamental act of the society: and such a change, however effected, is, according to Mr. Locke, (on Government, part ii. § 212.) who, says judge Blacklem, perhaps carries his theory too far, at once into an entire dislocation of the bands of government; and the people thereby reduced to a state of anarchy, with liberty to constitute to themselves a new legislative power.

Archdeacon Paley, in his discussion of this subject, has flated the expedients by which the British constitution provides for the interest of its subjects, and for its own preservation. With a view to the first of these purposes, it promotes the establishment of salutary public laws, by rendering every citizen of the state capable of becoming a member of the senate, and by investing every senator with the right of the four patricians in the deliberation of the legislature whatever law he pleases. In order to the attainment of this object, it provides such representatives of the people, with respect to their rank, condition, and character, the mode of their election, as well as the publicity and utility of their parliamentary deliberations, as shall be most likely to answer the end of their appointment, and to satisfy their constituents. (See Commons and Parliament.) For preventing depriving the inhabitants of their property, the constitution has committed the executive government to the administration and limited authority of our hereditary king. (See King.) The British constitution has also guarded the safety of the people in the two articles of taxation and punishment by the most judicious precautions. With regard to taxation, this buisness is exclusively referred to the popular part of the constitution, who, it is presumed, will not tax themselves, nor their fellow-subjects, without being first convinced that the aids which they grant are necessary. The application of the public supplies is also watched with the same circumvolution as the affilection. The national expenditure is accounted for in the house of commons, and computations of the charge, appropriated to any particular purpose, are previously submitted to the same tribunal. In the infliction of punishment, the power of the crown, and of the magistrate appointed by the crown, is confined by the most precise limitations: the offender's guilt, being submitted to the judg-
ment of 12 men, of his own order, and the nature and
degree of the punishment being ascertained by fixed laws.
In order to prevent arbitrary or clandestine confinement,
with all its injurious consequences, the constitution has
now fixed every one of these following: The ancient writ of
habeas corpus; the habeas corpus act of Charles II., and
the practice and determinations of our sovereign courts
of justice founded upon these laws, afford a complete remedy
for every conceivable case of illegal imprisonments. (See
these articles; and see also Treason.) The constitution has
also provided for its own preservation, by securing each part
of the legislature in the exercise of the powers assigned to it,
from the encroachment of the other parts. This security is
sometimes called the balance of the constitution; and the
political equilibrium, which this phrase denotes, consists in
two contrivances—a balance of power, and a balance of
interest. By the former is meant, that one part of the
legislature possesses no power, the abuse, or excess of
which it is not checked by some antagonist power residing in
another part. Thus, the power of the two houses of parlia-
ment to frame laws, is checked by the king’s negative;
and, on the other hand, the application of this negative,
checked by the privilege which parliament possess of, refu-
sing supplies of money to the exigencies of the king’s
administration. The constitutional maxim that the king
can do no wrong, is balanced by another maxim, not less
constitutional, that the illegal commands of the king do
not justify those who assist, or concur, in carrying them into
execution; and also, that the acts of the crown acquire
not any legal force, until authenticated by the subscription
of some of its great officers.” In coincidence with this
maxim, we might mention the check which parliament holds
over the administration of public affairs, in the practice of ad-
ressing the king, for the purpose of knowing by whole
advice be resolved upon a particular measure, and of puniting
the authors of that advice for their pernicious counsel.
Again, the power of the crown to direct the military force
of the kingdom, is balanced by the annual necessity of re-
porting to parliament for the maintenance and government
of that force. The prerogative of the king, in declaring
war, is checked by the privilege which the house of commons
possesses, of granting or withholding supplies necessary to
carry it on. The king’s choice of his ministers, is controlled by
the obligation he is under of commanding those men to offices
in the state, who are found capable of managing the affairs
of his government, with the two houses of parliament.

By the balance of interest, which accompanies and gives effi-
cacy to the balance of power, is meant this, that the respective
interests of the three estates of the empire, are so disposed
and adjusted; that whichever of the three shall attempt
any encroachment, the other two shall unite in resisting it.
The exercise of arbitrary power, on the part of the king,
would corrupt the power and privileges of the commons,
deprive their dignity, and endanger their independence.
It would also be no less formidable to the grandeur of the
aristocracy than fatal to the liberty of the republic; as it
would reduce the nobility from their hereditary participation
in the national councils, which constitutes their true great-
ness, to the low and servile state of making a part of the
empty pageantry of a despotic court. On the other hand,
if the commons should entrench upon the crown, the house
of lords, attached to the monarchy which gives them their
distinction, would instantly receive an alarm from every
new extent of popular power. If the nobles themselves
should attempt to revive the superiority, which was exercised
by their ancestors under the feudal constitution, the king
and the people would alike remember how the one had been
insulted, and the other enslaved, by that barbarous tyranny.
And all it should be remembered, that there is a wide dif-
terence between the constitution, or the theory of govern-
ment, and the actual exercise of it, nor should those anoma-
lies, or irregularities, which occur in peculiar circumstances,
or periods of the public administration, be charged on the
constitution itself. It is a well-known, and often cited ob-
server of Montesquieu, in reference to the British con-
stitution, “as all things have an end, the state we are
speaking of (viz. England,) will lose its liberty, and perish.
Having not Rome, Sparta, and Carthage perished? It will
perish when the legislative powers shall be more corrupt than
the executive.” Lyttelton’s Hist. of Hen. ii. Hume’s Hist.
chap. 7. Rapin’s Hist. of Eng. vol. i. Montesqu. Spirit of
Laws, vol. i. b. xi. chap. 6.

CONSTRUCTION, compounded of con, together; and
stringers, to tie or close up; the act of binding, or drawing
the parts of a thing close together.

CONSTRICCTOR CUMNI, in Myology, a name applied
to the sphincter muscle of the vagina. See Generation,
organ of.

CONSTRICCTOR JUHNI SACIUM, one of the muscles be-
longing to the soft palate. See Deglutition.

CONSTRICCTOR NASI. See Compressor.

CONSTRICCTOR ORIS. See Oricularis Oris.

CONSTRUCTORES PHARYNGIS. See Deglu-
tition.

CONSTRUCTION, in Geometry, the art or manner of
drawing, or describing a figure, scheme, the lines of a
problem, or the like. The equality of the lines of such a
triangle, &c. is demonstrated from their construction.

Construction of equations, is the method of reducing
a known equation into lines and figures; whereby the truth
of the rule, canon, or equation, may be demonstrated geo-
metrically. Or, it is the method of finding the roots or
unknown quantities of an equation, by the geometrical
constructions of right lines or curves, according to the
order or rank of the equation. The roots of any equation
may be determined; that is, the equation may be con-
structed of the intersections of a right line with another
right line or curve of the same dimensions with those of the
equation to be constructed; for the roots of the equation are
the ordinates of the curve at the points of intersection with
the right line; and it is well known, that a curve may be cut
by a right line in as many points as its dimensions amount to.
Thus, a simple equation will be constructed by the intersec-
tion of one right line with another: a quadratic equation,
or an affected equation of the second rank, by the inter-
sections of a right line with a circle, or any of the conic
sections, which are lines of the second order, and which may
be cut by the right line in two points, which will give
the two roots of the quadratic equation. A cubic equation
may be constructed by the intersections of the right line with
a line of the third order, &c. &c. But if, instead of the
right line, some other line of a higher order be used; then
the second line, whose intersections with the former are to
determine the roots of the equation, may be taken as
many dimensions lower as the former is taken higher. And,
in general, an equation of any degree may be constructed by
the intersections of two lines whose dimensions, multiplied
together, produce the dimension of the given equation.
Thus, the intersections of a circle with the conic sections,
or of those with each other, will construct the biquadratic
equations or those of the fourth power, because
\[ \sqrt{2} \cdot 2 = 4 \];
and the intersections of the circle or conic sections with a
line
line of the third order, will construct the equations of the fifth and sixth powers, &c. &c. Hence it appears, that the method of constructing equations is different, according to the diversity of equations.

To construct a simple equation. The whole mystery consists in this, that the fractions, to which the unknown quantity is equal, be reduced into proportional terms: the method of which will be better shewn by examples than it can be taught by many rules.

1. Suppose \( x = \frac{ab}{c} \), or \( cx = ab \); then will \( e : a :: b : x \), to be determined by the method of finding a fourth proportional.

2. If \( x = \frac{b^2}{a} \), or \( ax = b' \); then \( a : b :: b : x \), a third proportional to \( a \) and \( b \).

3. Suppose \( x = \frac{a-bb}{b} \); let \( d : a :: b : \frac{a-bb}{b} \). This fourth proportional found, being called \( g \); \( x = \frac{g}{e} \), which is therefore found as in the first case.

4. Suppose \( x = \frac{ab-bb}{a} \), or \( cx = a^2 - b^2 \). Since \( a \) and \( b \); let \( f \) and \( \frac{a+b}{a} \) be \( \frac{ab-bb}{a} \); then will \( af + e = 2ab \); and therefore, \( \frac{a+b}{a} = \frac{ab-bb}{a} \).

Thus is the present case brought to the preceding one.

5. Suppose \( x = \frac{a^2 - b^2}{b} \). Find \( \frac{af}{b} \), and make \( \frac{af}{b} + e = 2b \);

then will \( af + e = 2b \). Hence, \( x = \frac{a^2 - b^2}{b} \).

Consequently, \( b \times x = a^2 - a \times d = a \times -d \); and \( b : a :: x : -d \).

6. Suppose \( x = \frac{a^2 + b^2}{b} \), or \( cx = a^2 + b^2 \). Contrafuct the triangle \( A BC \) (Plate I, Analysis, fig. 8) whose side \( A B = a, \), \( BC = b \), then \( AC = \sqrt{a^2 + b^2} \). Let \( AC = m \);

then will \( a^2 + b^2 = m^2 \). And therefore \( x = \frac{m^2}{c} \); consequently, \( c : m :: m : x \), a third proportional to \( c \) and \( m \).

7. Suppose \( x = \frac{a^2 - b^2}{c} \). On \( AB \) (fig. 9) \( = a \), describe a femicircle, and therein set \( AC = b \). Since the angle \( A C B \) is rectangular; \( CB = \sqrt{a^2 - b^2} \). Let \( CB = m \);

then will \( x = \frac{m^2}{c} \); consequently, \( c : m :: m : x \).

8. Suppose \( x = \frac{a^2 + b^2}{c} \), or \( cx = a^2 + b^2 \). Contrafuct the triangle \( A BC \) (Plate I, Analysis, fig. 8) whose side \( A B = a, \), \( BC = b \), then \( AC = \sqrt{a^2 + b^2} \). Let \( AC = m \);

then will \( a^2 + b^2 = m^2 \). And therefore \( x = \frac{m^2}{c} \); consequently, \( c : m :: m : x \).

9. Suppose \( x = \frac{a^2 - b^2}{c} \). On \( AB \) (fig. 9) \( = a \), describe a femicircle, and therein set \( AC = b \). Since the angle \( A C B \) is rectangular; \( CB = \sqrt{a^2 - b^2} \). Let \( CB = m \);

then will \( x = \frac{m^2}{c} \); consequently, \( c : m :: m : x \).

10. Suppose \( x = \frac{a^2 - b^2}{c} \). Say, \( b : a :: \frac{af}{b} \); and let \( \frac{af}{b} + e = bb \); then will \( b(e + af) = bb \). Hence, \( x = \frac{a^2 - b^2}{b} \).

Find between \( A C = c \) (fig. 10) and \( CB = d \).

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ture of the parabola, \(y^2 = 2x\), and \(x^3 = \frac{y^4}{b^2} \); substituting therefor these values for \(x^3\) and \(x\), it will be
\[
\frac{y^4}{b^2} \pm \frac{2}{b} \frac{y^2}{b} + \frac{y^2}{b} \pm \frac{2}{b} \frac{d}{d^3} + d^3 - d^3 = 0.
\]
Multiplying by \(b^3\), \(y^4 \pm 2bc + b^2 \times y^2 \pm 2 d b \times y + c^2 + d^2 - d^2 \times b = 0\).
Which may represent any biquadratic equation that wants the second term; since such values may be found for \(a\), \(b\), \(c\), and \(d\), by comparing this with any proposed biquadratic, as to make them coincide. And then the ordinates from the points, \(P\), \(P\), \(P\), \(P\), on the axis will be equal to the roots of that proposed biquadratic. And this may be done, though the parameter of the parabola (viz. \(b\)) is given: that is, if you have a parabola already made up, or given by it alone you may resolve all biquadratic equations, and you will only need to vary the centre of your circle and its radius.

If the circle described from the centre, \(C\), pass through the vertex \(A\), \(\left(\frac{3}{2}, \frac{14}{11}\right)\) then \(CP = CA = CD = AD\), that is, \(a^2 = d^2 + e^2\); and the half term of the biquadratic \((c^2 + d^2 - a^2)\) will vanish; therefore, dividing the term by \(b\), there is the cubic, \(y^3 \pm 2 b c + b^2 \times y \pm 2 d b = 0\).
Let the cubic equation proposed to be resolved be \(y^3 \pm p y \pm q = 0\). Compare the terms of these two equations, and you will have \(p = 2 b c + b^2 = \pm p, \) and \(\pm 2 d b = \pm r, \) or, \(\pm e = \pm \frac{1}{2} \pm \frac{1}{2} b, \) and \(d = \pm \frac{1}{2} \pm \frac{1}{2} b'\).
If you have this construction of the cubic \(y^3 \pm p y \pm q = 0, \) by means of any given parabola \(A P E\).

From the point \(B\) take in the axis (forward, if the equation has \(+p, \) but backwards, if \(p\) is negative) the line \(BD = \frac{p}{b}\), then raise the perpendicular \(DC = \frac{r}{2 b}, \) and from \(C\) describe a circle passing through the vertex \(A,\) meeting the parabola in \(P,\) so that the ordinate \(PM\) be one of the roots of the cubic \(y^3 \pm p y \pm r = 0\).

The ordinates that stand on the same side of the axis with the centre \(C\) are negative or affirmative, according as the half term \(r\) is negative or affirmative; and those ordinates have always contrary signs that stand on different sides of the axis. The roots are found of the same value, only they have contrary signs, when \(r\) is positive as when it is negative; the second term of the equation being wanting.

A cubic equation, that has all its roots equal, may be constructed by a circle. Let the radius \(O B = \frac{1}{\sqrt{3}}\), the line \(EF = r, \) \(GH\) the line of the arc \(O B\) or \(3 B E\).

Then, by trigonometry, \(s \times -\frac{4 s^3}{3} = G H.\) Draw \(C D\) parallel to \(A B,\) and put \(SF = e, \) \(S E = x, \) \(G H = b;\) then \(e + x = r, \) whence \(3 \times e + x = \frac{4}{3} \times \epsilon + x = \frac{3}{2} e;\) and this reduced will give \(x^3 + 3 e x^2 + 3 e x \epsilon + e^3\)
\[-\frac{3}{2} RR + \frac{1}{2} b RR = 0.\]

Suppose this cubic equation to be given; viz. \(e^3 + p \times e^2 + q \times e + r = 0.\) Comparing this with the former, and equating the coefficients, we shall have \(p = 3 e, \) and \(e = \frac{1}{3} \rho, \) also \(q = 3 e \epsilon - \frac{3}{4} R R = \frac{1}{4} \rho p - \frac{3}{4} e R R;\) whence
\[R = \frac{2}{3} \sqrt{p^2 - 9 q}, \text{ and } r = e^2 + \frac{1}{4} b R R - \frac{3}{4} e R R,\] and \(b = \frac{6}{3} (p - q) + \frac{2}{3} p.\) Hence we obtain the following rule for the solution of the given equation \(x^3 + p x^2 + q x + r = 0.\) With the radius \(\frac{2}{3} \sqrt{p^2 - 3 q}\) describe the circle \(B G A K.\) (fig. 16.) Draw the diameter \(A B,\) and \(C D\) parallel to it at the distance of \(\frac{1}{3} \rho;\) above it, if it be \(+ p,\) but below it, if it be \(- p.\)

Draw also \(Z G\) parallel to \(A B,\) at the distance \(\frac{9}{3} \sqrt{p^2 - 3 q} + \frac{2}{3} p,\) above it, if it be affirmative, or below it, if negative. Let it cut the circle in \(G.\)

Take the arc \(B P = \frac{1}{3} \sqrt{G K}, \) and make \(P Q = Q K = K P.\)

From the points \(P, P, K,\) let fall perpendiculars upon the line \(C D,\) which will be the roots of the equation; the affirmative above the line, and the negative below it.

\(N. B.\) If \(p\) be greater than \(p,\) the equation is impossible; for in this case the equation has two impossible roots. Also, if \(p = 0,\) then the radius of the circle \(O B = 2 \sqrt[3]{-3 q}\), and \(C D\) coincides with \(A B;\) and the distance of \(Z G\) from \(A B\) is \(\frac{2}{3}.\)

And if \(q\) be affirmative, the equation is impossible.

These constructions are easy: e.g. 1. Let \(x^3 + 9 x^2 - 22 x = 120 = 0.\)

Here the radius \(O B = \frac{2}{3} \sqrt{p^2 - 3 q} = \frac{2}{3} \sqrt{81 + 66} = 5(3,29),\) and \(1 \rho = 3,\) the distance of \(C D\) above \(A B.\)

And \(\frac{9}{3} \sqrt{p^2 - 3 q} + \frac{2}{3} p = \frac{1}{3} \sqrt{76 + 66} + 2 \times 6 = -6 + 6 = 6 = c,\) the distance of \(G Z\) from \(A B,\) which therefore coincides with it; and the arc \(G B,\) and also its third part is \(c,\) and \(P\) falls on \(B;\) and making \(P Q = Q K = K P,\) and letting fall perpendiculars on \(C D,\) we shall have \(P S = -3,\) \(Q T = +4,\) and \(K T = -10,\) the three roots required.

\(E. G.\) 2. Suppose \(x^3 - 17 x^2 + 82 x - 120 = 0.\)

The radius \(O B = \frac{1}{3} \sqrt{289} - 24 = 4.37; \frac{1}{3} \rho = -5.66,\) the distance of \(C D\) below \(A B,\) and \(\frac{9}{3} \sqrt{p^2 - 3 q}\) \(\frac{p}{p} = 3.37 \sqrt{890 + 1394} - \frac{2}{3} \frac{76}{3} = -4.03,\) the distance of \(G Z\) below \(A B.\)

Take \(B P\) the third part of \(B G,\) and making \(P Q = Q K = K P,\) and measuring the perpendiculars upon \(C D,\) we have \(P S = +4,\) \(Q T = +10,\) and \(K V = +5,\) the roots of the equation.

\(E. G.\) 3. Let \(y^3 - 13 y^2 + 2 y + 13 = 0.\) In this example \(p = 0,\) and therefore \(C D = \frac{1}{3} \sqrt{289} - 24\) coincides with \(A B;\) and the radius \(O B = \frac{2}{3} \sqrt{3 q} = \frac{2}{3} \sqrt{39} = 4.18;\) and \(\frac{3}{3} \sqrt{q} = -36,\) the distance of \(Z G\) above \(A B.\)

Take the arc \(B P = \frac{1}{3} \sqrt{289} - 24,\) the distance of \(G B,\) and make \(P Q = Q K = K P,\) and let fall perpendiculars on \(A B,\) and \(P S = +1,\) \(Q T = +3,\) and \(K V = -4,\) will be the roots required.
CONSTRUCTION.

If the roots of a cubic equation, $x^3 + qx + r = c$, be possible, they may be found by means of a table of coines. Let $DAC$ (fig. 20) be an angle whose whole coine, to the radius $m$, is $x$; in $AD$ take $AB = m$; from $B$, as a centre, with the radius $BA$, describe a circle cutting $AM$ in $C$, and from $C$, with the same radius, describe a circle cutting $AD$ in $D$; join $BC$, $CD$, and draw $BK$, $DM$, at right angles to $AM$ and $CL$ at right angles to $AD$. Then, the triangles $BAC$ and $BDC$ being isosceles, the angles $BAC$ and $BCA$ are equal, as also $CBD$ and $CDB$; and the perpendiculars $BK$, $CL$, bisect the bases $AC$, $BD$. Also, the angle $DBC = BAC + BCA = 2BAC$, and the angle $DCM = CAD + CDA = CAD + CBD = CAD + 2CAD = 3CAD$. Let $CM$, the coine of the angle $DCM$ to the radius $m$, be called $e$; thence, from the similar triangles $ABK$, $ACL$, $AB : AK :: AC : AL$, or $m : x :: 2x^3 = \frac{2}{m}$.

$AI$; and $AL - AB = \frac{2x^3}{m} - m = BL$; hence $AD$, or $AL + BL = \frac{4x^3}{m} - m$.

Again, $AB : AK :: AD : AM$, or $m : x :: \frac{4x^3}{m} - m : \frac{4x^3 - m^2}{m} = \frac{4}{m}$.

Let $AM$, and $AM - AC = CM = 4x^3 - 3m^2 = c$; therefore $4x^3 - 3m^2 = m^2$, and $4x^1 = -3m^2 - m^2 = 0$.

Let the equation $4x^3 - 3m^2 - m^2 = 0$, or $x^3 - \frac{3m^2}{4} = x$ = be made to coincide with the equation $x^3 - q x + r = 0$; that is, let $\frac{3m^2}{4} = q$, and $\frac{m^2}{4} = -r$, or $m = \sqrt{\frac{4q}{3}}$, and $\epsilon = -\frac{3r}{q}$; then, from a table of

colines, find the angle whose whole coine is $\frac{3r}{q}$ to the radius

$\sqrt{\frac{4q}{3}}$, and the coine of one-third of this angle, to the same radius, is one value of $x$. Hence it follows, 1. That if $A$ be the arc whose coine is $x$, and $P$ the whole circumference, $x$ is also the coine of $A + P$, or $A + 2P$; therefore the coines of $\frac{A}{3}$, and $\frac{A}{3} + \frac{A}{2}$, are also values of $x$. 2. Since the radius is greater than the coine, $\sqrt{\frac{4q}{3}}$ is greater than $\frac{3r}{q}$; or $\frac{4q}{3}$ is greater than $\frac{9r^2}{4}$; that is, $\frac{q}{27}$ is greater than $\frac{r}{4}$; therefore this solution can only be applied when the roots of the cubic equations are possible.

Vieta, in his "Canonica Recensione affections geometricarum," and Ghetaldius, in his "Opus poëllumum de Refolutoine et Compositione Mathematica," and also Des Cartes, in his "Geometria," have shown how to construct simple and quadratic equations. Des Cartes has also shown how to construct cubic and biquadratic equations, by the interception of a circle and parallel; and the same has been done by Bcker in his "Chiva Geometrica," or "Geometrical Key." (See the artice Bcker.) But the genuine foundation of all their constructions was balb and explained by Shaffus in his "Molalabrum," page 2. This doctrine is also treated of by De la Hire, in a small treatise, entitled, "La Construction des Equations Analytiques," annexed to his "Conic Sections." Sir Hane Newton, at the end of his "Algebra," has given the construction of cubic and biquadratic equations mechanically; and also by the conchoid and cissoid, as well as the conic sections. See also Dr. Halley's construction of cubic and biquadratic equations, and Colson's in the Philosophical Transact.; the Marquis de l'Hospital "Tracte Analytique des Sections Cylindriques," lib. iv.; and Maclaurin's "Algebra," part ii. chap. 3. However, the intent of these geometrical constructions is more readily answered by the method of extracting roots by converging series and approximation; and therefore this mode of obtaining them is very much like the

CONSTRUCTION, or Syntax, in Grammar, denotes the arranging and connecting of the words of a sentence, according to the rules of the language. See Syntax.

The construction is generally more simple, easy, and direct, in the modern tongues than in the ancient: we have very few of those inversions which occasion so much embarrassment and obscurity in the Latin; our thoughts are usually delivered in the same order in which the imagination conceives them: the nominative case, for instance, always precedes the verb, and the verb goes before the oblique cases it governs.

The Greeks and Latins, M. St. Evremont observes, usually end their periods, where, in good sense and fiction, they should have begun them; and the elegance of their language conflicts, in some measure, in this capricious arrangement, or rather in this transposidal disorder of the words.

Construction is either simple or figurative. Simple, is that wherein all the terms, or parts of the discourse, are placed in their natural order.

Figurative construction, is that wherein we recede from this simplicity, and use certain expressions, shorter, and more elegant than nature affords.

The syntax, or construction of words, is distinguished into two parts, concord and government, or regimen.

Construction of deeds and wills, in Latin, is regulated by aforesaid rules and maxims, which have been laid down by courts of justice. These are, 1. That the construction be favourable, and as near the minds and apparent intents of the parties, as the rules of law will admit. For the maxims of law are, that "verba intentioni debent interire," and "benigne interpretans certat propter simpliciitatem laicorum." And therefore the construction must also be reasonable, and agreeable to common understanding.

2. That "quoties in verbis nulla est arbitriata; ibi nulla expostio contra verba fraudula est;" but that where the intention is clear, too minute a fire be not laid on the firest and precise signification of words: "nun qui heret in litteris, heret in cortice." Therefore, by a grant of a remainder a reversion may well pass, and be conveyed. Another maxim of law is, that "nulla grammarica non vivat chartam," neither false English nor false Latin will delivcr a deed. 3. That the construction be made upon the entire deed, and not merely upon disjointed parts of it. "Nan ex antecedentibus et consequentibus fit optimam interpretation." And therefore that every part of it be (if possible) made to effect, and no word but what may operate in some shape or other. "Nam verba debent intelligi eum effici; ut res magis valscat quam placeat." 4. That the deed be taken most strongly against him that is the agent or contractor, and in favour of the other party. "Verba furtiis accipiuntur contra proferentem." As, if tenant in fee-simple grants to any one an estate for life, generally, it shall be construed an estate for the life of the grantee. 5. That, if the words will bear two senses, one agreeable to, and another
other against law, that sense be preferred which is most agreeable to it. As, if tenant in tail lets a lease to have and to hold during life generally, it shall be construed to be a lease for his own life only, for that stands with the law; and not for the life of the lessee, which is beyond his power to grant. 6. That, if there be in a deed two clauses to totally repugnant to each other, that they cannot stand together, the first shall be received, and the latter rejected. In this respect it differs from a will: for there, of two such repugnant clauses the latter shall stand. In both cases, however, we should endeavour to reconcile them. 7. That a device be most favourably expounded, to pursue if possible the will of the devisor, who, for want of advice or learning, may have omitted the legal or proper phrasal. Hence the law often dispenses with the want of words in devises, that are absolutely requisite in all other instruments. Thus, a fee may be conveyed without words of inheritance; and an estate-tail without words of procreation. By a will also an estate may pass by mere implication, without any express words to direct its course. With regard to a will, in this respect, there is no distinction between the rules of law and of equity: for the will, being considered in both courts in the light of a limitation of uses, is construed in each with equal favour and benignity, and expounded rather on its own particular circumstances, than by any general rules of positive law. Blackltf. Comm. b. ii. ch. 23.

**Construction of Statutes.** Comprehends the following rules: 1. In the construction of remedial statutes there are three points which require consideration, viz. the old law, the mischief, and the remedy; that is, how the common law stood at the making of the act: what the mischief was, for which the common law did not provide; and what remedy the parliament hath provided to cure this mischief. And it is the business of the judge to construe the act, as to suppress the mischief and advance the remedy. An influence may be specified in the prefatory flat of 15 Eliz. c. 10. By the common law, ecclesiastical corporations might let as long leases as they thought proper; the mischief was, that they let long and unreasonable leases, to the impoverishment of their successors: the remedy applied by the statute was the making void all leases by ecclesiastical bodies for longer terms than three lives, or 21 years. In the construction of this statute, it is held, that leases, though for a longer term, if made by a bishop, are not void during the bishop's continuance in his see; or, if made by a dean and chapter, they are not void during the continuance of the dean: for the act was made for the benefit and protection of the successor. The mischief is, therefore, sufficiently suppressed, by vacating them after the determination of the interdict of the grantor; but the leases, during their continuance, being not within the mischief, are not within the remedy. 2. A statute, which treats of things or persons of an inferior rank, cannot, by any general words, be extended to those of a superior. Thus, a statute, treating of "deans, prebendaries, parsons, vicars, and others having spiritual promotion," is held not to extend to bishops, though they have spiritual promotion: deans being the highest persons named, and bishops being of a still higher order. 3. Penal statutes must be construed strictly. Thus, by the statute 14 Geo. II. c. 6, feeding sheep, or other cattle, was made felony, by benefit of clergy: but other cattle being considered as too loose an explication for creating a capital offence, the act was held to extend to nothing but mere sheep. In the next sessions it was therefore found necessary to make another statute, 15 Geo. II. c. 34, extending the former to bulls, calves, oxen, fers, bullocks, beavers, calves, and lambs, by name. 4. Statutes against frauds are to be liberally and beneficially expounded. 5. One part of a statute must be to confided by another, that the whole may (if possible) stand: "ut re magis valesit quam perceat." As if land be vested in the king and his heirs by act of parliament, saving the right of A.; and A. has at that time a lease of it for three years; here A. shall hold it for his term of three years, and afterwards it shall go to the king. 6. A saving, totally repugnant to the body of the act, is void. If, therefore, an act of parliament vests land in the king and his heirs, saving the right of all persons whomsoever, or vests the land in A. in the king, saving the right of A.: in either of these cases the saving is totally repugnant to the body of the statute, and (if good) would render the statute of no effect or operation; and therefore the saving is void, and the land vests absolutely in the king. 7. Where the common law and a statute differ, the common law gives place to the statute; and an old statute gives place to a new one: and this upon a general principle of universal law that "leges posteriores priores contrarias abrogant," by conformation to which it was laid down by a law of the Twelve Tables at Rome, that "quod populus peregrinum juit, id jus ronu efo." This is to be understood only when the latter statute is couched in negative terms, or where its matter is to clearly repugnant, that it necessarily implies a negative. But if both acts be merciful affirmative, and the substantive such that both may stand together, here the latter does not repeal the former, but they shall both have a concurrent efficacy. 8. If a statute, that repeals another, is itself afterwards repealed, the first statute is hereby revived, without any formal words for that purpose. 9. Acts of parliament, derogatory from the power of subsequent parliaments, bind not. 10. Acts of parliament, that are impossible to be performed, are of no validity; and if out of them arise collateral any absurd consequences, manifestly contradictory to common reason, they are, with regard to those collateral consequences, void. Some have laid down this rule more largely, alleging that acts of parliament, contrary to reason, are void. We may further observe, that equity is frequently called in to aid, to moderate, and to explain positive laws. Nevertheless, our courts of equity are only conversant in matters of property. For the freedom of our constitution will not allow, that in criminal cases a power should be lodged in any judge, to confute the law otherwise than according to the letter. This caution, while it admirably protects the public liberty, can never bear hard upon individuals. A man cannot suffer more punishment than the law assigns, but he may suffer less. The laws cannot be strained by partiality to inflict a penalty beyond what the letter will warrant; but in cases where the letter induces any apparent hardship, the crown has the power to pardon. Blackltf. Com. vol. i. Intro. § 3.

**Construction Military.** This term, in its general and unlimited acceptance, extends to the constructing of every sort of military work. But it is commonly and peculiarly applied to the constructing of the different parts of the various systems of fortification that have been delivered by writers on the subject in different nations and languages. And to this application of it we shall chiefly attend.

Fear and necessity must have first given rise to works of defence or fortification, of which the object originally was safety or security. And although there must have been quarrels ever since there have been men, we have every reason to suppose that the erection of works of defence, even of the simplest kind, were frequent to the fishing and hunting flate of society, and even in a great measure to that of the pastoral.
CONSTRUCTION.

The discovery of America, which exhibited men in a much simpler state of society than any that was recorded prior to that event in history, faced or prefaced, afforded to specimens or traces of such works among tribes who had not formed some sort of villages, and become partly, at least stationary, by paying some attention to agriculture. The form and structure of works of defence, varied gradually with the means and the modes of attacking them. At first, a simple row of pickets, or a ditch, with that addition, was deemed sufficient. Afterwards, in woody countries (and all countries have been more or less covered with woods) an enceinte or enclosure of solid timber was made use of. Sometimes the walls round towns were raised with beams, earth, and stones. This mode of erecting them appears to have prevailed among the Gauls, in the time of Julius Cæsar, who, in the 23d chapter or section of his seventh book, "De Bello Gallico," expresses himself on the subject in the following words:

"Maris autem omnibus Gallicis haec fere forma eft. Tabulas directe perpetuas in longitudinum, paribus intervallis, diftantes inter le binos pedes, in fabulo collonctrur. Exe revinctur introitus, et multum aggeri velituri. Ea autem, quae diximus intervala grandibus in fronte lexius efficurunt. Quæ collocantur et augmentantur, alius insuper erit ad niediam inter idem intervallum tertiam, neque inter fer tantum tabulas, sed paribus intermedia spatia singulae singuli facris, interjectis arte continue, neque deinceps omne opus constantur dum quæ muri alto, latitudine explicantur. Hoc quum in græce variatatem opus deformare non eft, alterius tabulæ aut facris, quæ recta lineæ suo ordine servent, tum ad utilitatem et defendentem urbium summam habet opportunitatem, quod et ab incendio laps, et ad ariete maliadavendi defendit, quæ perpetuos tabulæ pedes quadragesimos, per quam introitus revincta, neque purrumpi neque dilrabi potest."
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D B M, are each of them equal to a right one, or 90 degrees. The angles of the epaules or shoulders A C E, B D F, are also each of them equal to a right angle. The angle diminished A F G, or B E H, or the angle A B E, or B A F, formed by the exterior side, and either line of defence being equal to the difference between 60 and 45 degrees, is of course equal to 15 degrees. The angle C E F, or D F E of the flank, is equal to 75 degrees, and the flanking angle C N D, is equal to 150 degrees. But since the angle C A E, which is half the flanked angle, or angle of the battalion, is equal to 45 degrees, and is by construction bisected by the right line A E, each of the angles C A E, E A C is equal to 22° 30'. And the angle A E C, the complement of C A E to 90°, is consequently equal to 67° 30'. The angle A E G is therefore equal to 37° 30', the angle A E F to 142° 30', the angle A G F to 130 degrees, and the angle E A B to 37° 30'. Also the angle A E B is equal to 127° 30'.

Thus then all the necessary angles are known for calculating the different parts of the construction. For the exterior side A B being given, the line of defence A F or B E is easily found by means of the triangle A F B, or the triangle A E B, by the following analogies.

As the sine of the angle A F B

Is to the sine of the angle A B F,

So is the site A B

To the side A F.

As the sine of the angle A E B

Is to the sine of the angle B A E,

So is the exterior side A B

To the line of defence B E.

And the right line A E, or its equal B F, is found by the following analogy.

As the sine of the angle A E B

Is to the sine of the angle A B E,

So is the right line A E, or its equal B F

To the site A B.

And as the angle A C E is a right one, we get the face A C of the battalion, and the flank C E, by means of A E, and the following analogies.

As radius

Is to the sine of the angle A E C,

So is the right line A E, or its equal B F,

To A C, the face of the battalion, or its equal B D.

And

As radius

Is to the sine of the angle C A E,

So is the right line A E, or its equal B F,

To the flank C E, or its equal D F.

The perpendicular to the exterior side A B, or the rectilinear distance from the middle of it, to the point N, the intersection of the ravel lines, or lines of defence, is determined by this analogy.

As radius

Is to the tangent of the angle B A N, or A B N,

So is half the exterior A B

To the perpendicular distance from the middle thereof, to the point N.

By means of the flank, the curtain is found by the following analogy.

As radius

Is to the secant of the angle C E F, or D F E,

So is the flank C E, or D F,

To the curtain E F.

And the capital A G of the battalion is found by this analogy.

As the sine of the angle A C E

Is to the sine of the angle A E G,

So is the right line A E

To the capital A G of the battalion.

In like manner, the demi-gorge E G, or F H, is found by the following analogy.

As the sine of the angle A G E

Is to the sine of the angle A E G,

So is the right line A E, or its equal B F

To the demi-gorge G E, or its equal F H.

The calculation of these different parts will be similar when the flank is perpendicular to the curtain, instead of the lines of defence as in polygons above an octagon, which is effected by taking the right lines N C, N D, equal, respectively, to the lines N E, N F. The flanks then are longer and better.

This author affirms no reason drawn either from the nature of the polygons, or their capability of being embraced or defended for the length of his perpendicular or the magnitude of the angle formed by an exterior side, and a line of defence. And, as in all polygons, from the hexagon upwards, the flanked angle or flank of the battalion, is the same, or equal to 90 degrees; his construction in all polygons, above an octagon, gives this perpendicular or angle much greater than it ought to be. Thus, in a decagon, it gives this angle equal to \[\frac{180° - 126° - 90°}{2} = 27°\]; whereas, it ought but very little to exceed 25°. And this construction on part of a right line, which may be regarded as a polygon of an infinite or rather indefinite number of sides, gives this angle equal to 45 degrees, and the flanking angles formed by the intersections of the lines of defence, equal each to 100 degrees. The lines of defence in this case exactly correspond with Montalbant's construction in his "Fortification Perpendiculaire."

As in this construction the angle diminished, or the angle formed by an exterior side and a line of defence increases half in magnitude, as the number of the sides of the polygon increases, being in the decagon twice as great as it is in the hexagon, the lengths of the curtains decrease and the faces of the battlements increase greatly beyond their just proportions, which is a material defect; since the faces, which are the weakest parts, being defended respectively, only on one side by a single flank, are thereby augmented, and the curtains, which are the strongest, being defended each on both sides, or by two flanks, are diminished.

His mode of placing the flanks in figures up to the octagon inclusive at right angles to the lines of defence, and in other polygons perpendicular to the curtains, though it certainly secures them well against the enemies' batteries, and renders them fit for defending the gates and curtains, (which, however, by their nearness to the flanks, are naturally beink fired), does not enable them to discover the enemy's batteries sufficiently to defend the counterflaps, and prevent them from advancing their works to it, a circumstance which affords great advantage to the besiegers. And if orillons be made in flanks, so placed, the covered flanks would be so hid, that they could scarcely see the ditch throughout its whole width, and the merlons from their angles towards the field being very acute, would easily be ruined by the enemy's batteries and rendered useless. Flanks ought to be placed perpendicularly,
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pendicularly, or at least very nearly so to the lines of defence. For when an enemy once makes a lodgment on the counterfearp, he will discover them whether they be so placed or not. And if flanks be discovered, they also discover, and being either revetted or demi-reveted and formed of earth that is well fettled, they are by no means so easily ruined as the batteries of the besiegers, which are formed of gabions and newly raised earth.

Count Pagan's method of construction on a polygon, (fig. 2.) is widely different from that of Errard, and also much preferable. For instead of making the angle of the flank acute in the octagon and figures of a smaller number of sides, it is only equal to a right one in any polygon of a greater number of sides, as Errard does, he makes it obtuse and places his flanks perpendicularly to the lines of defence, in order that they may discover more ground, and the better rafe and defend the faces of the bastions, which are the most faulant and weakest parts of the body of the place and are first attacked, breaches being commonly made in them. This ingenious author makes his lines of defence like Errard's, always faulant, but does not like him make 90 degrees the maximum of his flanked angle, or angle of his baftion.

He delivers constructions for three sorts of fortifications, namely, the great, the mean, and the little. He fortifies or constructs inwards, and in the great fortification makes the exterior side equal to 200 toises, in the mean equal to 180 toises, and in the little equal to 160 toises. He allows 60 toises to each face of a baftion in the great, 55 in the mean, and 50 in the little, in all figures above a square. He makes the perpendicular to the exterior side in the great fortification in all figures, except the figure where it is 27 toises, equal to 30 toises; in the mean equal to 24 toises; and in the little equal to 21.

The dimensions of these principal lines in these three kinds of fortification, are contained in the following Table.

<table>
<thead>
<tr>
<th>Great Fortification.</th>
<th>Mean.</th>
<th>Little.</th>
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<tbody>
<tr>
<td></td>
<td>In all other Polygons.</td>
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<tr>
<td>Exterior Sides.</td>
<td>200</td>
<td>180</td>
</tr>
<tr>
<td>Perpendiculars</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>Faces of bastions</td>
<td>60</td>
<td>55</td>
</tr>
</tbody>
</table>

Supposing then the exterior side A B, (see the figure,) equal to 200 toises in the great, to 180 in the mean, and to 160 in the little, biffect it in the point C. In C, which is perpendicular to A B, take C D equal to 50 toises, in all regular figures of a greater number of sides than four. Through the point D, draw the lines of defence A D H, B D G, on which take A E and B F, each equal to 60 toises in the great fortification, to 55 in the mean, and to 50 in the little. Then draw the flanks E G, F H, perpendicularly to the raft lines or lines of defence B G, A H, and form the curtain by joining the points G, H. This is Count Pagan's construction, without orisons and retired flanks.

The figure is a regular hexagon, supposed to have each of its sides equal to 180 toises, as in his mean fortification. The angle A O B of the centre is therefore equal to 60 degrees, and the angle of the polygon to 120. A C, or B C, is equal to 90 toises, the perpendicular C D is equal to 30, and the face A E, or B F, to 55 by construction.

Now by means of these lines and angles, the others are eas-

fily found. And in the first place, the angle diminui C A D, or the angle formed by the exterior side A P, and the line of defence A H, is formed by the following analogy.

As A C, equal to 50 toises, is to C D, equal to 30 toises, 
So is radius 
To the tangent of the angle C A D = 18° 26' 6" very nearly. If this angle be taken from 60 degrees, half the angle of the polygon, we get the angle O A H, or M A E, equal to 41° 33' 54". But this is equal to half the Jallant angle of the baflion, wherefore the whole flanked angle or angle of the baflion is equal to 83° 7' 48". And the flanking angle A D B, being equal to the excess of 180 degrees above twice the angle diminui, is evidently equal to 143° 7' 48".

The tenaille A D, being equal to \(\sqrt{A C + C D} \), is = \(\sqrt{50 + 30} \approx 9.779798552 \), nearly. Or it is found by this analogy.

As radius 
Is to the tangent of the angle diminui C A D, 
So is A C, half the exterior side A B, 
To the tenaille A D.

If from this there be taken the face A E, which is equal by construction to 35 toises, we get the right line D E, and the following analogy for the flank E G.

As radius 
Is to the line of double the angle diminui C A D, 
So is the right line D E 
To the flank E G.

And as the angle E G of the epaule or shoulder is always, in regular construction, equal to twice the angle diminui C A D, and the angle E G B formed by the flank and line of defence, the angle D E G is known, and D G is ascertained by the following analogy.

As radius 
Is to the line of the angle D E G, 
So is the right line D E 
To the right line D G.

The angle E G H of the flank, is in this construction equal to 90 degrees, together with the angle diminui, or the angle formed by the exterior side, and one of the lines of defence.

The complement, D G, or D H, being thus found, the curtain G H is ascertained by the following analogy.

As the line of the angle diminui D G H 
Is to the line of double the said angle, 
So is the complement D G 
To the curtain G H.

The lengthened curtain M H, or G N, is determined by the following analogy.

As the line of half the angle of the polygon 
Is to the line of half the flanked angle, 
So is the raftant line, or line of defence A H, 
To the lengthened curtain M H. From which, and the curtain G H, the inward or interior side M N is immediately obtained.

And the capital A M is ascertained by this analogy.

As the line of half the angle of the polygon 
Is to the line of the angle diminui, 
So is the raftant line, or line of defence A H, 
To the capital A M of the baflion.

It is manifest from the foregoing table, that the perpendicular in this learned and judicious author's great fortification, subfends in the square an angle of about 15° 6' 54" nearly, and in all other regular figures of about 16° 41' 57" nearly; that in his mean fortification it subfends in the square an angle of about
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about 14° 15' 4", and in all other regular figures an angle of about 15° 27' 6'; and that in his late fortification, it subtended in the square an angle of about 14° 44' 30", and in all other regular figures about 15° 33' 22".

For his extremities or retired batteries and oriollons, he builds his flanks, leaving one-half of each adjoining the epaule or shoulder for the orillon. The first flanks or battery on the other half is retired five octaves behind the orillon, and is two octaves above the level of the ditch; the second is retired seven octaves within the flanks, and is four octaves above the level of the ditch; and the third is retired seven octaves behind the second, and is six octaves above the level of the ditch, being as high as the rampart, which is three octaves above the level of the field, or terre-plain of the place, as the bottom of the ditch is three octaves below it. These are formed by continuing the lines of defence into the bastions, and drawing lines parallel to these continuations from the points bisecting the flanks.

He makes within each of his bastions a sort of smaller ba- 

tion, or a cavalier in the form of one, having its faces parallel to those of the bastion and 13 octaves distant from them, which serves as a retrenchment. The great ditch is 16 octaves wide, and its counter-carp is parallel to the faces of the bastions or to the lines of defence. The capital of each of the ravelins, which he places on the re-entering angles of the counter-carp in such a manner as to be defended by the faces of the bastions and the counter-guards before them, is equal to 30 octaves, and its faces are drawn to the flanks. The demi-gorges of the redoubt within the ravelin are each equal to 15 octaves, and the faces of it are parallel to those of the ravelin itself. The ditch of the ravelin is 12 octaves wide, and that of the redoubt 6. The solutio angle of each counter-guard is 40 octaves distant from that of the bastion which it covers, and this work is from 9 to 10 octaves broad at its extremities. The ditch before it is 12 octaves wide. The covert-way is 4 octaves wide, and the faces of the places of arms are each 8 octaves long, and parallel to the opposite counter-carp.

The flanks, curtain, and other lines in this construction found above by means of lines, tangents, and secants, may be ascertained without any logarithmic table, in the following manner.

Since the tenaille A D is $= 10 \times 90$ toises $= 90 \times 10$ toises, and A C is $= 90$ toises, by hypothesis, and C D is $= 30$ toises, by construction, or $= \frac{1}{3}$, we have A D : A C :: $\sqrt{\frac{10}{3}} : 3$, and A D : C D :: $\sqrt{\frac{10}{3}} : 1$. But A D : A C :: A E (57 toises by construction) : the exciss of A C above one half of E F, which exciss is therefore equal to $\frac{1}{3} \times \frac{35}{\sqrt{10}}$ toises, and its double, which is the exciss of A B above E F, is of course equal to $\frac{320}{\sqrt{10}}$ toises, or to $32 \sqrt{10}$ toises; consequently E F is equal to $180 - 32 \sqrt{10}$ toises; but A D : C D :: E F : $\tilde{H}$ H, and A D : A C :: E F : E H; therefore the flank F H is equal to $180 - 32 \sqrt{10}$ toises $= 18\sqrt{10} - 33$ toises; and E H is equal to $\frac{540 - 99 \sqrt{10}}{\sqrt{10}}$ toises $= 54 \sqrt{10} - 99$ toises. And since E D is $= A D - A E = 30 \times 10 - 55$ toises; we get D H equal to $24 \sqrt{10} - 44$ toises. But A D : A B :: D H : G H, which is therefore equal to $\frac{144 \sqrt{10} - 264}{\sqrt{10}}$ toises; and D I, which is equal to a sixth part of G H is equal to $\frac{24 \sqrt{10} - 44}{\sqrt{10}}$ toises.

Consequently C I is equal to $\frac{54 \sqrt{10} - 44}{\sqrt{10}}$ toises. And C G

: C I :: O A : the capital A M of the bastion. Count Pagans's flank, in his mean fortification, being to the perpendicular, as $18 \times \frac{10}{10} = 30$, is upwards of 3 toises less than it, which is certainly too great a difference.

This learned and judicious author, whom the principal fortifiers since his time, particularly Vauban, have very much followed, considering that the flanks, ramparts, and ditches, were the works that contributed most powerfully towards the defence of the body of a place, and the retarding of the approaches of an enemy to it, made the demi-gorges of his bastions large, in order to have three flanks or batteries on each of them, sufficiently long for placing four pieces of cannon in, respectively. Three of these, in each of the said three flanks, are, by his construction, so well covered from the counter-batteries of the besiegers, that they cannot easily be damaged by them. And the besiegers, on approaching the breaches, and attempting to make lodgments in the ruins of them, must suffer greatly from the guns so covered in those retired flanks, as they are then fired on by them, de revers, or in the rear.

Though his division of fortification, into great, mean, and little, seems not to be of much use, or moment, he must certainly be allowed to be the first writer on the subject that gave the true position to his flanks, making them perpendicular to the lines of defence. His mean fortification appears to be preferable to the great, as it does not make the lines of defence too long for musquete-shot. The position of the flanks, and great length, he gives to the faces of his bastions, render his demi-gorges long enough to afford a sufficiency of room for his retired flanks.

The two ditches, with the two ramparts, that he makes, are well calculated for obstructing and retarding the enemies' passage of the ditch, for depriving them of the use of fourneaux, and for preventing them from lodging themselves on the ruins of the breaches. For when the besiegers have even passed the main ditch, and taken the first rampart, they will find themselves exposed in the second ditch to the besiegers's fire on all sides, and liable to be destroyed by shells, hand-grenades, fourneaux, mines, &c.

By giving one-half of his flank to the orillon, he covers his retired batteries extremely well. The ditch is very well defended from the flanks, which being perpendicular to the lines of defence, look fully along the faces of the opposite bastions.

It must be observed, however, that though the position of his flanks be good, they are too small, particularly in polygons of a considerable number of sides, being a good deal shorter than the perpendiculars to the exterior sides; whereas they should be equal, or nearly equal to them, as perpendiculars to the exterior sides of polygons were first introduced into construction for the sole purpose of obtaining flanking defences. This is in a great measure occasioned by his making the faces of his bastions too long, which he was probably led to do from a desire of obtaining three retired batteries in each flank. The face of the bastion is equal to the $\frac{1}{3}$th part of the exterior side, whereas it may with confidence be asserted, that it ought not to exceed a fourth. For the faces of the bastions are most fiant, and consequently the tenderest part of the body of the place. They are always first attacked, and in them the breaches are constantly made. But when they are very long, the besiegers

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can make large breaches in them, which is a great advantage to them, and a no less disadvantage to the besieged.

The retrenched bastion, or redoubt in form, of one within the bastion, must inconvenience the expense at least one-third. The ditch before it is but ill defended, and as there are tenailles for that purpose. And as it is hollow or empty, it may be taken as easy as the main bastion, by means of a second mine, and thereby occasion the loss of the place, especially as no retrenchment can be raised within to enable the besieged to capitulate with more advantage.

His retired flanks, or batteries, appear to be too near to one another, being only seven toises distant from outline to outline. He makes no traverses. But this cannot be imputed to him as either an oversight or fault, as firing en ricochet was not known in his time. By giving the same length of perpendicular to the exterior sides of all figures of a greater number of sides than four, he makes the flanked angle, or angle of the baflion in a polygon of a considerable number of sides, very obtuse. This angle begins to become obtuse in the hexagon, and by his construction on part of a right line, it is no less an angle than one of 145° 4' 48'. He assigns no reason whatsoever for the length of his perpendicular, derived from the properties of different polygons, or their relative degree of importance and capability of defence, nor for giving the same perpendicular in all regular figures of a greater number of sides than four. His perpendiculars are mere arbitrary assumptions, like those of all other authors, who have written on fortification since his time. The truth however is, that every regular figure has a perpendicular of its own, which is different from that of any other, of a precise and determinate length, and bearing a given ratio to the exterior side.

Mr. Blondel's method of construction is as follows:

Like Count Pagan he fortifies inwards, but instead of the perpendicular he begins with the angle diminué, or the angle formed by an exterior side, and a line of defence. This angle is determined by taking a right angle, or 90 degrees from the angle of the polygon, and adding 15 degrees to a third part of the remainder. Thus, if \( n \) denote the number of the sides of a regular figure, the angle of the polygon, or the angle contained by two of its sides, will be equal to 180° - \( \frac{360°}{n} \), and his angle diminué will of course be equal to 30° - \( \frac{120°}{n} + 15° \) or 45° - \( \frac{120°}{n} \), which gives 15° for it in the square, 21° in the pentagon, 25° in a hexagon, and in his construction on part of a right line 4° 5', which then makes the perpendicular equal to half the exterior side. This expression for his angle diminué, as is evident by inspection, is always equal to the excess of 45° above \( \frac{120°}{n} \) divided by the number of the sides of the figure; whereas it is always found without any reference whatsoever to the angle of the polygon, by dividing \( 120° \) by the number of the sides of the figure, and subtracting the quotient from 45°. And since the angle of the centre, or the angle subtended by one of the sides of the figure, is equal to \( \frac{360°}{n} \), this angle diminué is had by taking from 45 degrees a third part of the angle of the centre.

His angle diminué gives the angle of the baflion, or flanked angle, in a square equal to 60 degrees, in a pentagon equal to 66 degrees, in a hexagon equal to 70 degrees, and in a construction on part of a right line equal to 90 degrees.

The flanked angle, or the angle formed by the lines of

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tant from the counterfearp, which distance therefore forms its ditch. The principal object in erecting this counter-guard is to conceal from the enemy's view the low flanks opposite to it, whilst its narrowness or small breadth puts it out of his power to place his guns in after he has taken it.

The salient angle of his ravelin is determined by the intersection of two arcs, described from the shoulders of the two adjoining bastions, with a radius equal to the distance between them. Its face produced meets those of the bastions about 6 toises from the shoulders and are bounded on the lines or faces of the counter-guards produced, which also determine the gorge of the ravelin.

The ditch of the ravelin is from 10 to 12 toises broad, and that it may be the better defended, Mr. Blondel takes, in the face of the bastion, a space equal to this breadth, commencing six toises from the shoulder, in which he makes a low battery of 1 or 5 feet high, and another on the inside of the same height with the parapet of the place, and retired about 9 toises within the face.

The ditch before the counter-guards is 10 toises broad. The ravelin not only covers the shoulders and the outworks of each bastion, but likewise defends the ditch of the counter-guard, as he takes as much of its face as is sufficient for seeing or discovering all that to make two batteries in, viz. a low one and a high one in the same manner as he does in the faces of the bastions. He allows no more terre-plain in the ravelin, than is just enough for the recoiling of his guns, leaving all the rest of its inside empty for the purpose of being able easily to countermine the rampart, and to prevent the enemy from making a lodgment in it, after he may have forced it.

The better to cover the batteries in the face of each bastion, which defend the ditch of the ravelin, he adds in the angles of the counterfearp of the ravelin *lunette*, in the form of lozenges, allowing 20 toises for the semi-gorge in each. These have their faces parallel to the counterfearps of the 4 toises before the ravelin and counter-guard, and the ditch before them 8 toises broad.

The author likewise makes a *lunette* in his great ditch from 7 to 9 toises broad, which he carries quite round the work to prevent the low flanks, which would otherwise easily accessible, from being got at. A smaller or narrower *lunette* might also be made in the ditches of the outworks, particularly when there are batteries in the demi-lunes or ravelins.

The calculations for the angles and lines of a construction on the sides of a polygon, according to Mr. Blondel's method, are made in the following manner.

Since the figure referred to is a hexagon, the angle of the centre is equal to 60 degrees, the angle of the polygon to 120, and the angle *diminué*, B A F or A B E, to 25 degrees.

The flanking angle, A E B, is 70 degrees, and the flanked angle, N A G, or D B S, is equal to 70 degrees. Therefore half the flanked angle, L B O, or F A P, is equal to 35 degrees.

The tensile A G, and of course the face A C of the bastion, is found by the following analogy.

As the sine of the angle A G B
Is to the sine of the angle A B C,
So is the exterior side A B
To the tensile A G, of which the face A C is one-half.

From the sine of defence A F, which is seven-tenths of the exterior side A B, we get the complement G F or G E, and the curtain E F of course by this analogy.

As the sine of the angle E F G
Is to the sine of the angle E G F,
So is the complement E G
To the curtain E F.

And as the sum of the angles C E F, E C F, is equal to 180°—the angle *diminué* C F E (25°) = 155°, and C F, E F, are known, we have this analogy.

As the sum of the sides C F, E F
Is to their difference,
So is the tangent of 75°, half the sum of the angles,
To the tangent of half their difference.

Half the difference added to half the sum, gives C E F the angle of the flank, and taken from half the sum gives E C F the supplement of A C E the angle of the *épaleur* or shoulder.

And for the flank C E we have the following analogy.

As the sine of C E F, the angle of the flank,
Is to the sine of the angle *diminué* C F E,
So is C F
To the flank C E.

The demi-gorge E P is determined by first finding the lengthened curtain F P by this analogy.

As the sine of the angle A P F, which is known,
Is to the sine of the angle E A P which is also known,
So is the line of defence A F = 70° of A B
To the lengthened curtain F P.

Then from F P so found take the curtain E F, and there will remain the demi-gorge E P.
<table>
<thead>
<tr>
<th>Table of the Angles of the different Parts of the Construction, according to Mr. Bowdler's Method.</th>
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<tbody>
<tr>
<td><strong>Angle</strong></td>
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<tr>
<td>Square</td>
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tant from the countercarp, which distance thence forms its ditch. The principal object in erecting this counter-
guard is to conceal from the enemies' view the low flanks
opposite to it, whilst its narrowness or small breadth puts it
out of his power to place his guns in after he has taken it.

The salient angle of his ravelin is determined by the in-
tersection of two areas described from the shoulders of
the two adjoining bastions, with a radius equal to the dis-
tance between them. Its faces produced meet those of the
bastions about 6 toises from the shoulders and are bounded
on the lines or faces of the counter-guards produced, which
also determine the gorge of the ravelin.

The ditch of the ravelin is from 10 to 12 toises broad,
and that it may be the better defended, Mr. Blondel takes,
in the face of the bastion, a space equal to this breadth, com-
muting six toises from the shoulders, in which he makes a
low battery of 4 or 5 feet high, and another on the inside
of the same height with the parapet of the place, and re-
tired about 5 toises within the face.

The ditch before the counter-guards is 10 toises broad.
The ravelin not only covers the shoulders and the millions
of each bastion, but likewise defends the ditch of the coun-
terguard, as he takes as much of its face as is sufficient for
seeing or discovering all that to make two batteries in, viz.
a low one and a high one in the same manner as he does in
the faces of the bastions. He allows no more terre-plain
in the ravelin, than what is just enough for the recoiling of
his guns, leaving all the rest of its inside empty for the
purpose of being able easily to countermine the rampart,
and to prevent the enemy from making a lodgment in it,
after he may have forced it.

The better to cover the batteries in the face of each bas-
tion, which defend the ditch of the ravelin, he adds in the
angles of the countercarp of the ravelin lunette, in the
form of lozenges, allowing 20 toises for the demi-gorge in
each. These have their faces parallel to the countercarps
of the ditches before the ravelin and counterguard, and the
ditch before them 8 toises broad.

The author likewise makes a lunette in his great ditch
from 7 to 8 toises broad, which work to prevent the low flanks, which would be otherwise eaily accessible, from being got at. A smaller or narrower lunette might also be made in the ditches of the outworks, particularly when there are batteries in the demi-lunes or
ravelins.

The calculations for the angles and lines of a construction

on the sides of a polygon, according to Mr. Blondel's me-
thod, are made in the following manner.

Since the figure referred to is a hexagon, the angle of the
centre is equal to 60 degrees, the angle of the polygon to
120, and the angle diminish, B A F or A B E, to 25 degrees.
The flanking angle, A G B, is 130 degrees, and the flanked
angle, N A G, or D B S, is equal to 70 degrees. Wherefore
half the flanked angle, E B O, or F A P, is equal to 35
degrees.

The tenaille A G, and of course the face A C of the
ballion, is found by the following analogy.

As the sine of the angle A G B
Is to the sine of the angle A B G,
So is the exterior side A B
To the tenaille A G, of which the face A C is one-half.
From the line of defence A F, which is seven-tenths of
the exterior side A B, we get the complement G F or G E,
and the curtain E F of course by this analogy.

As the sine of the angle E F G
Is to the sine of the angle E G F,
So is the complement E G
To the curtain E F.
And as the sum of the angles C E F, E F C, is equal to
180°—the angle diminish C F E (25°) = 155°, and C F,
E F, are known, we have this analogy.

As the sum of the sides C F, E F
Is to their difference,
So is the tangent of 7° 30', half the sum of the angles,
To the tangent of half their difference.
Half this difference added to half the sum, gives C E F
the angle of the flank, and taken from half the sum gives
E C F the supplement of A C E the angle of the epincl or
shoulder.
And for the flank C E we have the following analogy.

As the sine of C E F, the angle of the flank,
Is to the sine of the angle diminish C F E,
So is C F
To the flank C E.
The demi-gorge E F is determined by first finding the
lengthened curtain F P by this analogy.

As the sine of the angle A P F, which is known,
Is to the sine of the angle F A P which is also known,
So is the line of defence A F = tan of A B
To the lengthened curtain F P.
Then from F P is found take the curtain E F, and there
will remain the demi-gorge E F.

| TABLE |
### TABLE of the Angles of the different Parts of the Construction, according to Mr. Blondel's Method.

<table>
<thead>
<tr>
<th>Angles</th>
<th>AMB of the Centre</th>
<th>QAB of the Polygon</th>
<th>MAB half of that of the Polygon</th>
<th>NAC half of the flanked, or of the base-line</th>
<th>MAC of the flanked</th>
<th>CAC diminué</th>
<th>AGB flanking, or of the tenaille</th>
<th>FGD supplement of flanking angle</th>
<th>FDB of the Epaul or shoulder</th>
<th>FDC supplement of the Epaul</th>
<th>DFE of the flank</th>
<th>GFD</th>
<th>G111°</th>
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<tbody>
<tr>
<td>Square 4 sides</td>
<td>90°</td>
<td>90°</td>
<td>45°</td>
<td>60°</td>
<td>30°</td>
<td>15°</td>
<td>150°</td>
<td>30°</td>
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<td>60°</td>
<td>123° 47'</td>
<td>107° 47'</td>
<td>120°</td>
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<td>72°</td>
<td>108°</td>
<td>54°</td>
<td>66°</td>
<td>33°</td>
<td>21°</td>
<td>138°</td>
<td>42°</td>
<td>132°</td>
<td>48°</td>
<td>123° 11'</td>
<td>100° 41'</td>
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<td>120°</td>
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<td>70°</td>
<td>35°</td>
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<td>50°</td>
<td>140°</td>
<td>40°</td>
<td>123° 48'</td>
<td>97° 48'</td>
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<td>128° 35'</td>
<td>64° 17½'</td>
<td>72° 51'</td>
<td>36° 25½'</td>
<td>27° 52'</td>
<td>124° 16'</td>
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<td>30°</td>
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<td>31° 40'</td>
<td>116° 40'</td>
<td>63° 20'</td>
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<td>125° 20'</td>
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<td>72°</td>
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<td>80°</td>
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<td>125° 28'</td>
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<td>90°</td>
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<td>180°</td>
<td>0°</td>
<td>135°</td>
<td>90°</td>
<td>45°</td>
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TABLE of the Lines of the different Parts of the Construction according to Mr. BLONDEL's Method.

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<td>120</td>
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<td>131 1/2</td>
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<td>320 1/2</td>
<td>257 1/2</td>
<td>56 1/2</td>
<td>122 1/2</td>
<td>84</td>
</tr>
</tbody>
</table>

CONSTRUCTION.
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This ingenious author also gives a table of the lengths of the different lines in his construction on the two following suppositions:

1st. That the exterior side of each figure is equal to 200 toises.

And 2dly. That the exterior side of each figure is equal to 170 toises.

Mr. Blondel was undoubtedly a man of considerable talents and eminence, and had travelled over the greatest part of Europe, America, and the West Indies, making sensible and judicious observations on the various modes of fortifying, practised by different nations.

His acuteness however in discovering the mistakes committed by others, and his anxiety to avoid them, did not prevent him from falling into still greater ones himself. He did not attend sufficiently to the great expence that the execution of his method would unavoidably occasion, or to the numerous artillery that would be required for its defence.

Imagining, that places are generally lost for want of sufficient flanks, he makes three, one behind another. They are however so near to each other, that the rubbish of the higher ones must certainly render the lower ones useless: and were shells to fall into the lower ones they must unquestionably destroy the troops for want of room to avoid them. They are moreover too open and liable to be destroyed from the covert-way, as the counter-guards are not broad enough to cover and screen them from the enemies' fire. The low flanks are too narrow and too much confused. Before shells, however, were much used at sieges, they might have afforded a good defence.

He makes no use of traverses. But this is not to be imputed to him as a fault or omission, as rocket-firing was not used in his time.

His great ditch appears to be too wide, being not less than 25 toises before the faces of the baftions.

His angle diminué must be allowed to be preposterously great, as he makes it of as many degrees as it ought to be in a construction on a straight line, or on the sides of a polygon of an infinite or indefinite number of sides.

The following is the construction according to Mr. Dombelle's method.

Like Count Pagan he establishes three sorts of fortification. But instead of constructing inwards like him, he constructs outwards. His three sorts he denominates the little royal, the mean, and the great royal. The interior side of the little royal is equal to 60 rods of 12 Paris feet each, or 120 toises, that of the mean is equal to 70 such rods or 140 toises, and that of the great royal is equal to 80 such rods or 160 toises. His manner of fortifying in all the three is the same, and is the following.

Having determined on the side A B, (fig. 4.) (which we shall here suppose to be that of a hexagon,) for the mean, or little royal, allow a fifth part of it for the demi-gorges A C, B D; and a fourth part of it for the flanks C E, D F, each of which must make, with the curtain C D, an angle of 100 degrees. Then the points, G, H, of the baftions are ascertained by the rafant lines C H, D G, and the whole operation or construction is furnished.

As the construction in this figure is supposed to be made outwards on three of the sides of a regular hexagon, the angle A O B of the centre is equal to 60 degrees, and the angle G H K of the polygon is equal to 120 degrees. But the angle E C D of the flank is by construction equal to 100 degrees, the demi-gorge A C or B D is equal to a fifth part of the interior side A B, and the flank C E or D F is equal to a fourth part of A B. Conseqently the sum of the angles C D E, C E D, is given equal to 80 degrees, and the sides C E, C D, are given; wherefore we have this analogy.

At the sum of the curtain C D and flank C E
Is to their difference,
So is the tangent of 40° half the sum of the angles C D E, C E D
To the tangent of half their difference.

Hence the angle diminué C D E or C D G, the angle C E D the supplement of the angle C E G of the epaule or shoulder, and A G D half the flanked angle, or half the angle of the baftion, are given.

And as the lengthened curtain A D or B C is given by the construction equal to four fifths of the interior side A B, we have the following analogies for D G, the line of defence, and A G the capital of the baftion.

As the line of A G D, half the angle of the baftion,
Is to the line of the angle A G D,
So is the lengthened curtain A D To the line of defence D G.
And,
As the line of A G D, half the angle of the baftion,
Is to the line of the angle diminué A D G
So is the lengthened curtain A D To A G the capital of the baftion.

In like manner we obtain D E from the triangle C E D by means of the following analogy.

As the line of C D E, the angle diminué,
Is to the line of E C D, the angle of the flank,
So is the flank C E which is given
To the right line D E, which taken from D G, the line of
defence, gives E G the face of the baftion.

And as in this figure, which is supposed to be a hexagon, the exterior side G H, or line joining the flulant angles of two adjoining baftions, is equal to O G the perpendicular distance of the point I, the intersection of the lines of defence from G H is obtained by the following analogy.

As radius
Is to the tangent of I G Z, the angle diminué,
So is G Z, the half of G H or O G, in this figure,
To I Z, the perpendicular distance of I from G H.

And the perpendicular distance of the intersection of the rafant lines, or lines of defence, from the curtain, is found by this analogy.

As G H or O G in this figure
Is to the curtain C D,
So is I Z
To the perpendicular distance I Y of I from C D.

And in any other regular figure than a hexagon, G H is found by this analogy.

As O A, the radius of the circumscribing circle,
Is to the interior side A B, which is given,
So is O G = O A + A G
To G H, the side of the exterior polygon.

And as radius
Is to the tangent of I G Z, the angle diminué,
So is G Z equal to half G H,
To I Z, the perpendicular distance of I from G H.

And as G H, the side of the exterior polygon,
Is to C D the curtain, which is known,
So is I Z, the perpendicular distance of I from G H,
To I Y, the perpendicular distance of I from the

curtain.

Mr. Dombelle, in the construction of each of his three sorts of fortification, makes the angle E C D or F D C of the flank, always equal to 100 degrees, and the angle diminué G D C or H C D invariably equal to about 20° 56'.

For
CONSTRUCTION.

For CD being always equal to three-fifths of AB, and CE equal to a fourth part of AB, the ratio of \( CD + CE \) to CD - CE is a given or constant ratio, being that of 17 to 7, whatever be the length of AB. And the construction of his mean fortification gives the demi-garde AC or BD, equal to 28 toises, the curtain CD, equal to 8\( \frac{2}{3} \), the lengthened curtain ED or BC, equal to 11\( \frac{2}{3} \), the line of defence DF or CH, equal to 3\( \frac{1}{3} \), the capital AG or BH of the bastion, equal to about 0\( \frac{3}{5} \), the face CE or HF of the bastion, equal to about 6\( \frac{1}{10} \). And in all the three the ratio of DY half the curtain, to DY the perpendicular distance from it to I, the intersection of the lines of defence, or of GZ, half the side of the exterior polygon, to ZI, the perpendicular distance from it to the said point of intersection, is given or constant, being always that of radius to the tangent of 20° 50'. The construction of his mean fortification on the sides of a hexagon gives ZI, equal to about 38,884 toises, and YI to about 16,066 toises.

This author makes his main ditch, or the ditch of the body of the place, 12 rods of 12 Paris feet each, or 24 toises broad, beyond which and opposite to the curtain he places a ravelin, the salient angle of which is in the intersection of two arcs described with the lengthened curtain AB, or BC, as radius from the extremities A, B, of the interior side AB, and the faces of which produced across the main ditch would terminate on the shoulders ii, i, of the square ordnans, that cover his rounded flanks or caissons, which are described in the following manner.

From the extremities C, D, of the curtain, and perpendicularly thereto, he draws two other flanks, C, i, D, i, meeting the lines of defence in the points i, i, lengthening the faces GE, HF respectively by Ei, Fi in order to have room enough in each flank of every bastion for two covered ones, which are constructed in the following manner:

To take the two lines Gr, Hr, equal each to a third part of Gi or Hi, (Ci, Di being drawn from the extremities C, D, of the curtain C, D perpendicularly thereto), and the lines ik, ik, also equal each of them to a third part of Ci or Di. From the points r, r, r, r, drawn right lines, rkl, rkl, through the points k, k, terminated at the points l, l, by the right lines Ci, Di, drawn perpendicularly to the lines of defence GD, HC, which must be produced till they meet the radii of the polygon in some points as p, p, in order to take upon the same radii the distances pg, pg, for terminating the covered flanks, of which the common centre x is found by describing from the extremities Db, Cb, of the right lines Ci, Di, arcs with a radius equal to three-fourths of Cb or Di.

The distance between the two covered flanks on each flank of every bastion is equal to 12 rods of 12 Paris feet each, or twenty-four toises, and the parapets every where arc to inch rods or 4 toises thick.

The caissons which Mr. Bonbelle adds at the points of the bastions, and which, in cases of necessity, may serve as retrenchments, are described by taking on the capitals of the bastions the right lines Gs, Hs, equal respectively to half the lines Gr, Hr, and describing from the points s, s, as centres, arcs rr, rr, for the caissons, each of which has its parapet 4 toises broad. They are somewhat lower towards the points of the bastions than the other parts of the bastions, and the ways to them are through palfages as o, o, in the bastions.

This author covers his ravelin with a fort of counter-guard or tenaille beyond its ditch, which he makes 8 rods of 12 Paris feet each, or 16 toises broad, or a third part of the breadth of his great ditch, thus rendering his ravelin a tenailled, or horned half-moon.

Round covered flanks were first invented by the Italians; and Mr. Bonbelle uses them in order to render them the more capacious, and the fitter for resisting the shock and effects of the enemies' cannon. They seem, however, to have too much convexity, advancing too far towards the centre of each bastion, and leaving too small a distance between the two high flanks.

As his flanks are great, he makes use of no second flanks on the curtains. But contrary to sound sense and reason, and inconsistently with the genuine principles of construction, he makes them of the same lengths or sizes in all polygons. His angle dimidiate also is invariably of a given magnitude, viz. of 20° 50', which by his construction on the sides of a square leaves the flanked angle, or angle of each bastion, equal only to 45° 8' in a pentagon, to 66° 8', in a hexagon, to 75° 8', and so on. His angle dimidiate in a square, is therefore more than double what it ought to be, by upwards of two degrees. And in a pentagon it does not fail quite 7½ degrees short of being twice as great as it should be in reality. He makes it even greater in a square than it ought to be in an octagon.

Mr. Vauban in his method fortifies inwards; and like Count Pagan, from whom he has borrowed his perpendicular for the hexagon and all higher polygons, begins with the perpendicular to the exterior side, and the parallel lines of defence. He does not, however, make the faces of his bastions so long, or his flanks quite so short. And he omits second flanks as not of very great moment, as they can be added at any time, without changing either the flanks or curtains.

Differ, as in Count Pagan's construction, the exterior side AB in the point C (fig. 5.) At the point C erect a perpendicular, CD, equal to an eighth part of AB in the square, to a seventh part of AB in the pentagon, and to a fifth part of AB in the hexagon and all higher polygons. From the extremities A, B, through the point D, draw the lines of defence AD, BD. On these take AE, BF for the faces of the bastions, equal each to two seventh parts of AB, and take EH, FG, each equal to EF, the distance between the shoulders E and F. Then join the points G, H, for the curtain GH. And if a similar construction be made on each of the other sides of the figure or polygon, we get the matter-line of the curtains and bastions, or the principal or outline of the body of the place. To this must be added a rampart from 10 to 12 toises broad at the base, and elevated more or less above the level of the place, on the outer part of which, at top, there is raised a parapet three toises broad at the base, and elevated above the rampart from 6 feet to 7. The ditch of the body of the place, or the great ditch, is 20 toises wide opposite to the flanked angles or salient angles of the bastions, and it is formed by describing from the angles with a radius of 22 toises, circular arcs, and drawing right lines from the epaules, or shoulders, to touch these arcs. For the parts of these lines lying between their intersections and the points of contact, together with these arcs, form the outline of the ditch.

The foregoing figure is a regular hexagon, and the exterior side is here supposed to be equal to 180 toises.

To determine the flanking angle S (fig. 6.) of the half-moon or ravelin, let off 50 toises on the perpendicular DC, produced beyond the exterior side AB; from the point S draw right lines to the counterface of the great ditch, so that if produced across the same, they would, according to some authorities, terminate on the epaules or shoulders of the bastions, but according to others, about 3 toises from the shoulders on the faces of the bastions. These lines to drawn from...
CONSTRUCTION.

from the flanant angle S. of the ravelin to the counterflank,
form the faces S. L. S. M. of the half-moon or ravelin. It is
generally supposed that when the faces S. L. S. M. of the
ravelin terminate when produced across the great ditch on
the faces of the bastions a few toes from the epauls or
shoulders, they cover the flanks much better than they do
when they terminate on the shoulders themselves.

The ditch before each ravelin is 12 toises broad; its
counterflank is parallel to the faces, and is made of a cir-
cular form, before the flanant angle of each like the ditches
before the flanant angles of all works in general.

When the ravelin is made with flanks, as PN, QO, the
faces S. P. S. Q. when produced across the great ditch,
ought to terminate on the faces of the bastions 5 toises at
least from the epauls or shoulders.

When a ravelin has flanks, they are commonly made by
setting off 10 toises from L to P, and M to Q, from the
extremities of the faces, and by drawing them from the
points P. Q. parallel to the capital S. of the ravelin.

There is sometimes a redoubt made in a ravelin, which is
done by settling off from the extremities, L, M, of the
faces on the semi-gorges L. M. M. L, and then drawing right
lines for its faces parallel to those of the ravelin. The ditch
before such a redoubt should be 6 toises broad, and its
counterflank parallel to its faces.

Orillons and retired flanks are described in the following
manner.

The front, AEG, HFB, being described as above
taken, EA equal to a third part of the flank EFG. From
the opposite flanked angle B, draw the right line B a, on
which produced take &b, equal to 5 toises. Take also on
the line of defense, EFG, produced, Ge equal to 5 toises,
and join Ge. On b as a base describe the equilateral tri-
gle bGe, and from the angular point G as a centre, denote
the circular retired flank Ge with the radius fG or fc.

Again, if ED be bisected in the point c, and ed be drawn
perpendicular to Ed to meet a perpendicular to the face
AE, from the point E in the point d, and if from the
point d as a centre a circular are be described with dE as
radius, we shall get the circular orillon EA.

ab is called the revers, or back part of the orillon, and
to the enforcement or depth of the fatemate or concave
flank be.

In like manner are the retired or concave flank bI, and
the circular orillon FG described.

The orillons are useful in covering the retired or concave
flanks, which by means of them cannot be seen but directly
in front. And as Mr. Vauban makes his orillons round,
they cannot be so easily destroyed as they might be were
they of any other figure or form.

The calculation of the lines and angles of a construction
on a polygon, according to this method of Mr. Vauban, is
as follows:

If AB be supposed to be the side of a hexagon, the
angle of the centre will be equal to 60°, and the angle
of the polygon to 120°. And as the perpendicular CD is by
the construction equal to a sixth part of AB, the angle
diminished ABD or BGH is determined by the following
analogy:

As AC or BC, the half of ABD; or, As 2
To is CD the perpendicular, f or, Is to 1,
So is radius
to the tangent of the angle CAD or CBD, which is
nearly equal to 18° 26' 6". Wherefore the flanked angle
or angle of the flank is equal to 53° 6' 48" nearly. And
since the triangle EFG is isosceles by the construction, and
the angle EFG, which is equal to the angle ABD, is of

enfilme equal to 15° 26' 6", we have the angles FEG,
EGF, equal each to half the excess of 18° 26' 6",
or to 8° 40' 57" nearly. Wherefore the angle EGF
of the flank, which is equal to the angle FGE, together
with the angle GFE, or angle diminished, is equal to 99°
45' 30". And the angle AEG of the epaul, or shoulder,
being equal to the angle EGF or EGD, together with
the angle EGD, which is equal to the angles ABD, BGD,
taken together, or to twice the angle diminished, is equal
to 117° 45' 30".

Now since AC, half of the exterior side AB, is given, and
CD is found by the foregoing analogy, AD is known,
its square being (47 E. I.) equal to the squares of AC and
CD; and as AE is equal to two sevenths of AB, the exter-
ior side ED is known. But AD is to ED, as AB is to EF or FG,
which are of course known. Or, either of
these lines may be found by the following analogy.

As the line of the angle EFD, which is equal to the
angle diminished, or to 18° 26' 6"
Is to its opposite side DE,
So is the line of the angle EDF, which is equal to 18°
twice the angle diminished, or to 15° 26' 6"
To the opposite side EF, the distance between
the epauls.

And if from EF, or its equal EH, there be taken ED,
the complement DH, or its equal DG, will be known.
Wherefore the curtain GH is determined by either of the
two following analogies.

As AD
Is to the exterior side AB,
So is the complement DG or DH
To the curtain GH.

Or: As the line of the angle diminished DGH
Is to the line of the angle GDH, which is 117° 45' 30"
So is the complement DH
To the curtain GH.

The flank E is easily found by means of either the tri-
gle EFG, or the triangle EGD, as in the following
analogies.

As the line of the angle FGH, which is 8° 46' 57"
Is to the line of the angle EFG, which is 8°
twice the angle diminished, or 18° 26' 6"
So is EF the distance between the two opposite epauls
To the flank E.

Or: As the line of the angle EGD, which is 8° 46' 57"
Is to the line of the angle EDG, which is 8°
twice the angle diminished, or 15° 26' 6"
So is ED the distance from the epaul to the interfe-
cence of the lines of defence
To the flank E.

And as half the flanked angle is equal to 41° 33' 36",
and the angle AHG, which is equal to the angle diminished,
to 18° 26' 6" nearly, the angle formed by the capital of
the bastion, and the lengthened curtain, or the curtain HG
produced to meet the same, will be equal to 120° or 18°
more. Wherefore the lengthened curtain is found by this
analogy.

As the line of 120° or 18°
Is to the line of 41° 33' 36", half the flanked angle,
So is AH
To the lengthened curtain: from which, if the curtain
HG be taken, we get the demi-gorge.

And the capital of the bastion is found by this analogy:

As the line of 120° or 18°.
Construction.

Is to the sine of 15° 25' 0", the angle diminished.

To the capital of the bastion.

And the perpendicular distance, D1, of the curtain from the intersection of the lines of defence is found by the analogy, as A B is to C D, so is G H to D1.

Supposing the exterior side A B, as in his mean fortification, to be equal to 100 toises, the principal lines belonging to the construction may easily be found, as in the following manner.

The perpendicular C D being by construction = \( \frac{A B}{6} \)

is = 30 toises.

The tenaille A D or B D being equal to \( \sqrt{BC^2 + CD^2} \)
is equal to \( \sqrt{10000} \) = 94.8633298 nearly.

The face B F of the bastion is commonly equal to 50 toises, or two-leavens of A B nearly.

The distance D F of the epaule F from the intersection D of the lines of defence being equal to B F - D F, is equal to 10.\( \sqrt{30} \) = 44.8633298 nearly.

If from the epaule F there be drawn F I perpendicular to the exterior side A B, we shall have B I = \( \frac{BC \times DF}{BD} \)

5 = 90 toises = \( \frac{BD}{2} \) = 47 = 341149 toises nearly; and F I = 5 = 10 toises = \( \frac{CD \times BF}{BD} \) = 15.813883 toises nearly.

The distance E F, between the two opposite epaules, E, F, or its equal E H or F G, is equal to A B - 2 B I = A B - B D = 182 - 50 = 48.13167 toises nearly.

The complement D G or D H being equal to F G - D F = 230 - 10 = 360 toises = 40.26334 toises nearly.

The perpendicular distance D I of the intersection of the lines of defence from the curtain G H being = \( \frac{CD \times DG}{BD} \)
is equal to 12.732861846 toises nearly. Consequently the perpendicular distance C I between the exterior side A B and the curtain G H being equal to C D + D I, is equal to 46.3232861846 toises nearly.

The curtain G H being equal to six times D I, is equal to 138.\( \sqrt{10} \) - 360 toises, or 76.5943171 toises nearly.

If F M be drawn perpendicularly from the epaule F to A H, the line of defence, E m, being equal to \( \frac{EF \times BC}{BD} \)
is equal to 5 = 10 - 90 toises, or 82.76299365 toises nearly.

The perpendicular F M being to E M as C D is to B C, is equal to a third part of E M or \( \frac{18.\sqrt{10} - 50}{2} \) toises, or 26.021 toises nearly.

The distance m H of the point m from the extremity H of the line of defence being equal to E H - E M, is equal to 270 - 84.\( \sqrt{10} \) toises, or 43 = 68765442 toises nearly.

The distance D m of the point m from the intersection D of the lines of defence being equal to E m - D F or E m - D E, is equal to 24.\( \sqrt{10} \) - 40 toises, or 35.894653848 toises nearly. But since F E H is an isosceles triangle, the angle F E H or D B C is equal to twice the angle m F H, which is therefore equal to 9° 13' 30" nearly.

The flank F H being equal to \( \sqrt{FM^2 + mH^2} \) =

3 = 16.109 - 50.\( \sqrt{10} \) toises, is equal to 27.2732895 or 27.7767008 toises nearly. And if from the extremity H of the line of defence A H there be drawn H M to meet the face F D of the bastion in the point m, we shall have H M equal to

\[ \frac{DH \times FM}{mD} = \frac{230 - 60 \times 10}{18.\sqrt{10} - 30} \]

toises, or 30.1720 toises, exceeding the perpendicular C D to the exterior side by 0.1976 of a toise only.

And as F M is a fourth proportional to D M, m H, and D F, or is equal to

\[ \frac{mH \times DF}{Dm} = \frac{270 - 84.\sqrt{10} \times 50}{10 - 30} \]

toises, it is equal to 5.161 toises nearly. And D M is equal to 30.362 toises nearly.

Now in Count Pagan's construction, from whom Mr. Vauban has borrowed the length of his perpendicular, on which the other parts chiefly depend, the flank F H is equal to 18.\( \sqrt{10} \) - 33 toises, or 23.021 toises nearly, which falls short of the perpendicular F M, drawn from the epaule F, in Vauban's construction, to the line of defence A H, by 3 toises, and of the flank F H by 3.3322805 toises. In any polygon, having its exterior side equal to 100 toises, their perpendiculums are equal, as well as the fanatical angles of their bastions. And we are persuaded, that even the greatest admirers of Vauban can afford no good reason for his not having followed Count Pagan also, with regard to the position of his flank, and placed it at right angles to the line of defence, instead of making them meet in an angle of 80° 40' 57". There is great reason to suppose, that the Count would have made the face of his bastion considerably shorter than he did, had he not intended to have three flanks instead of one. He makes it 55 toises. But it is naturally to be presumed, that he had intended to construct with a single flank, he would have bisected the perpendicular distance between his orillon and inner flank, (which is 19 toises,) and drawn his flank at right angles to the line of defence through this point of bisection, thereby forming a more complete construction for the body of the place than Vauban has done. And it is somewhat remarkable, that this line nearly coincides with the perpendicular H m, to Vauban's line of defence, from its point H of intersection with the flank. Had he, therefore, instead of taking 5 toises from the face of Count Pagan's bastion, taken 10, and then placed his flank at right angles to the line of defence, he would, without lengthening this line, have given the face of his bastion its proper length, and, at the same time, made the flank itself about equal to the perpendicular, as it ought to be, since perpendiculums to the exterior sides of polygons were first introduced into construction for the sole purpose of obtaining flanking defences. The lengths, however, with both these authors, as well as the other writers on fortification, are merely arbitrary, and by no means derived from reasoning either on the properties of the figures, or their relative degrees of importance and capability of defence. For there appears no reason for giving the same perpendicular to a hexagon and every other polygon of a greater number of sides, as Vauban has done, or to all regular figures above the square, as Count Pagan has done.

This author retains part of the facade-bray, which used to go round the whole body of the place, at the distance of from 4 to 5 toises from the flanks, making use of it as tenaille opposite to his curtains, which are made differently.
A tenaille is commonly from two to three feet only higher than the level ground of the ravelin. The tenaille \(a b c d e f g, \text{ Plate VI. fg. 7.}\) is constructed by first setting off from the capes \(B, F, \) on the lines of defence \(E, F, g,\) equal each to three toes, for a paille Rouge between it and the flanks of the bastions; then taking \(a g, f g,\) for its faces, equal each of them to 16 toes, by describing from the shoulers \(b, f,\) as centres, arcs with a radius equal to \(b f,\) and then by intersecting these arcs from the same shoulers as centres, with a radius equal to 10 toes, for its flanks \(b, f e,\) some, however, make the faces \(a b, g f,\) equal to half the lines \(a D, f D, g D\) respectively, and place the flanks at right angles to the lines of defence, which is certainly the best position for them.

The tenailles \(a b c d, e f g b, (f g, f S.)\) are without flanks, and have their faces on the lines of defence. The paille Rouge between them, as well as the pailles between them and the flanks, are three toes wide. These are called "\(a\) simple tenailles, and the foregoing is called a "reinforced tenaille. There is also a third sort of tenailles, which have only faces \(a b, g f,\) and flanks \(b c, f e,\) without a curtain.

Simple tenailles, with their faces on the lines of defence, but without flanks, are not so well calculated for scouring and defending the ditch as either the "reinforced tenailles are, or those with faces, and flanks without curtain. However, as they are not liable to be enfiladed, Mr. Vauban has generally preferred them to the other two, in most of the places which he fortified.

The "reinforced tenailles defend the ditch much better, and add low flanks to those of the bastions, but are liable to have their own flanks enfiladed, an inconvenience that might be remedied by constructing them in such a manner as to be covered by the extremities of the parapets of the opposite ravelins, or by the adjoining lunettes. These are well calculated for scouring not only the ditch, but also the level ground of the ravelin, and the ditch before the corps de guard, reduit, or redoubt, commonly made within it, which cannot be so well feen or defended from any other parts.

Those with faces and flanks only, have the same advantages with thefe as to the defending or scouring of the ditch, but are also, like them, liable to have their flanks enfiladed, which should be guarded against in the same manner.

The better to scour and defend the ditch, and oppose its paille Rouge, this further places it in, opposite to the middle of the tenaille, or of the curtain, a caponiere, or double way, covered with a parapet raised three feet above the bottom of the ditch. It is about 15 feet broad, is perpendicular to the curtain, and is parfalled on both sides. This work is good and very useful, as it commands without being com- manded, and serves as a paille for the musketeers from the body of the place to the outworks. He thus has four flanks for the defence of his ditch, namely, that of the body of the place, that of the orillon, that of the tenaille, and the caponiere.

Tenailles are reckoned to necessary, that it is with good reason that there are few places fortified without them. For when the ditch is dry, the spaces behind them serve as places of arms, from which the troops may fallly to oppose the enemies' defcent of the ditch, to retard his operation, and destroy his works in it, and then retire to them as places of safety. They also render the communication between the body of the place and the ravelins more easy and secure, which is a great advantage, as the ravelins are thereby enabled to make a much better defense than they otherwise could do, being readily supplied at any time with troops and necessaries. And when the ditch is wet, the spaces behind them serve as harbours for boats, which armed men can make use of, both for opposing the paille of the ditch, and for facilitating the communication between the tenailles and the ravelins.

This fortifier, in order to increase the strength of a place, places frequently works called lunettes (which literally signify small obstructions) on both sides of his ravelin. He sometimes makes one face of his lunette perpendicular to the middle of the face of the ravelin, and sometimes perpendicular to the face of the ravelin, and to as produced to the same about one-third from the faliant angle. In the former case he makes that face of the lunette equal to 30 toes, and determines its other faces by taking for the demi-gorge 25 toes, on the counter-scarp of the great ditch from that of the ditch before the ravelin; in the latter he makes the demi-gorge equal to 20 toes only. The ditch before the lunettes is 12 toes broad, the thicknees of the parapet is equal to three toes, and that of the rampart to eight, as in the ravelin.

When he makes use of lunettes, he sometimes covers the faliant angle of the ravelin with a work called bonnet, of which the faces are parallel to those of the ravelin, and when produced bifect those of the lunettes. The ditch before it is ten toes wide.

Tenailon. The term tenailon is sometimes applied to a "reinforced tenaille; but it is generally confined to a work somewhat like a lunette, made on each side of a ravelin, but differing from a lunette in this circumstance, that one of the faces of a tenailon, though it is 30 toes long, like that of the lunette, is in the direction of the ravelin produced by one of its ditch, whereas that of the lunette is perpendicular to it. The other face of the tenailon is determined by taking 15 toes on the counter-scarp of the great ditch from that of the ravelin. There is sometimes a tenailon a battery 15 toes long, and 10 toes retired from the front and parallel thereto.

There are generally retrenchments in tenailles which have their parapets either parallel to their fronts or perpendicular to their other faces, which, when produced, terminate on the faces of the bastions. The ditch before such a retrenchment is about three toes wide, and as these works are commonly made of earth, without any revetment of masonry, there is a bankette, called bern, before the parapet, next to the ditch, about eight feet broad, to prevent it from falling into the fame.

As to the construction of counter-guards, horn-works, crown-works, covert-ways and places, detached redoubts, second ditches, and covert-ways, and profiles. See the fame under these articles respectively. Mr. Vauban, in his second method with tower-bastions, according to the plans of Landau and Besford, begins with his construction towards, and fortifies outwardly in the following manner.

Supposing \(A B (f g, f),\) to be the interior side of the hexagon of 120 or 130 toes, draw \(A C, B D\) from the centre thereof, through the extremities \(A, B;\) set off six toes from \(A\) to \(B,\) and from \(B\) to \(C,\) through the points \(b, c,\) draw right lines at right angles to \(A B,\) on which set off six toes from \(B, f,\) and \(c, b,\) and four toes from \(b, d,\) and \(c, e,\) to \(g,\) and from the points \(f, d,\) draw perpendiculars \(f r, d n,\) to the capital \(A C,\) as also from the points \(b, g,\) perpendiculars to the capital \(B D,\) Then, if \(r, e, c, f, p,\) the points \(E, F,\) will be the faliant angles of the tower-bastions, of which \(E f, d\) and \(f b, g q,\) are the halve.

If on the capitals \(A C, B D,\) there be taken \(E, F, D,\) equal each to 40 toes, the points \(C, D,\) will be the faliant angles of the counter-guards before the towers. From the points \(C, D,\) draw the lines of defence \(C r, D b,\) to the points \(c, b,\) where the flanks of the towers intersect the cur-
CONSTRUCTION.

On these set off 36 toises, from C to G, and D to H, for the face CG, DH, of the counter-guards. The flanks and tenailles are found or determined as in his first method.

The ditch before the faillant angles of the towers is 6 toises broad, and its counterfcarp is drawn to the extremities of the flanks of the counter guards. The right line, which joins the ends of these flanks, determines the infide of the tenailles.

The ditch before the counter-guards is 12 toises broad at the faillant angles; and its counterfcarp is drawn towards the opposite shoulders, in the same manner as in his first method.

The capital of the ravelin is 45 toises, and its faces, when produced, terminate on those of the counter-guards, about 10 toises from the shoulders. Ten toises, however, are cut off from the faces of the ravelin, for the flanks which are parallel to its capital.

The ditch before the ravelin is 10 toises broad, the covert-way five, the demi-gorges of the places of arms 12 each, the faces 17 each, and the glacie is 30 toises broad.

The construction of Mr. Vauban's third method, according to the plan of New Briisach, is applied to an octagon, of which the exterior side is equal to 180 toises, and is made inwards. The perpendicular to the exterior side is, as in his first method, equal to 50 toises. The faces of the counter-guards are each of them equal to 60 toises. The flanks are found by setting off 22 toises, in arcs described from the opposite shoulders, as centres, and with the distance between as radius. A right line drawn through the extremities of the flanks, parallel to the exterior side, to meet the capitals of the counter-guards, determines both the infide of the tenailles, and the faillant angles of the tower-batillon.

And if another right line be drawn parallel to this, at the distance of 9 toises from it, the points, where it meets or intersects the capitals of the counter-guards, will be centres of the towers; from which points, if seven toises be set off each way for their demi-gorges, the positions of their flanks, which are perpendicular to the said line, will be determined. For each of these flanks, five toises are set off outwards, and four from the said line. And the line joining the infide of the flanks at the end of four toises completes the towers.

The ditch is 6 toises broad before the faillant angles of the towers, and its counterfcarp meets the line joining these angles, within 15 toises of the extremities of the flanks of the counter-guards.

The great ditch before the counter-guards is 15 toises broad, and its counterfcarp is parallel to the faces. The capital of the ravelin is 35 toises in length, and that of the redoubt within it, is equal to 25 toises. The faces of the ravelin are drawn towards those of the counter-guards, within 15 toises from the shoulders, and these of the redoubt are parallel to these. Twelve toises are cut off from each face of the ravelin, and fix from each of the redoubts by the flanks, which are parallel to its capital. The ditch before the ravelin is twelve toises wide, and that before the redoubt is fix. The covert-way and glacie are the same as in his second method. The profiles also are nearly the same in both. This method, indeed, differs but little from his second, except in two small flanks, of about four toises each, which in this he makes in each curtain, that are not in the other. The parapets of his counter-guards, on both sides of the faillant angles for the distance of about twenty feet, are raised four feet higher than the red, to prevent these works from being annoyed by ricochet-batteries.

In Mr. Vauban's first method of military construction, it may not be amiss to give a table of the principal parts thereof, for drawing the matter-line by, as also an ichnographical one of the principal dimensions of the body of the place, tenailles, ravelin, covert-way, traverse, and places of arms, as published with his approbation (for he never published anything himself respecting it.)

### TABLE for the Construction.

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And the following is an ichnographical table of the thicknesses, &c. of the works composing the body of the place, &c.

<table>
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<td>Thickness of the rampart at its base</td>
<td>Thickness of its rampart in the face and flank at the base</td>
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<tr>
<td></td>
<td>Thickness of the parapet at its base</td>
<td>Thickness of the rampart of its curtain at the base</td>
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<td></td>
<td>The breadth of the ditch</td>
<td>Thickness of its parapet at the base</td>
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<td>11</td>
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The Covert-way, Traverse, and Places of Arms.

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
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</thead>
<tbody>
<tr>
<td>Thickness of its rampart at the base</td>
<td>10</td>
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<tr>
<td>Thickness of its parapet at the base</td>
<td>3</td>
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<tr>
<td>Length of the demi-gorge of the places of arms at the re-entering angles</td>
<td>10</td>
</tr>
<tr>
<td>Length of the faces, each of the places of arms</td>
<td>12</td>
</tr>
<tr>
<td>Length of the traverses at the re-entering angles</td>
<td>3</td>
</tr>
<tr>
<td>Length of the traverses at the failing angles</td>
<td>4</td>
</tr>
<tr>
<td>Thickness of each traverse at the base</td>
<td>3</td>
</tr>
</tbody>
</table>

The traverses on the sides where their banquettes are, or on their infides, are from 3 to 3 1/2 feet high, and from 3 to 4 on the outside, towards the covert-way, which they four at the re-entering angles.

He gives his captives a banquet on each side, and the parapet of the place two or three, to suit men of different heights or stature, that they may all of them fire on the same level.

He makes a cut opposite to each traverse in the parapet of the covert-way, 4 1/2 or 5 feet deep, for the soldiers to pass, which he flushes up with a small merlon, except at the failing angles, where such cuts could not be seen by those who defend the place.

When he gives flanks to his ravelin, he makes places of arms in its ditch, perpendicular to its faces, and near the angles of the epaules, to prevent the passage of the same. When the counterchange of the ditch is revetted, or faced with masonry, he makes steps at all its angles for the convenience of the troops, and the service of the covert-way. Each detached piece or work should, for a similar reason, have a pair of flairs to lead up to it.

He makes the countermines of a place under the terreplain of the rampart, on a level with the ditch, and about ten feet distant from the revetment, to which they are parallel, and have a communication with it through small arched heads, or passages. From the countermines of the place men go down into the caponiers, and then up into the countermines of the covert-way, from which heads or passages are carried on under the field to fourmets or small mines, made for blowing up the besieger's works, and retarding their approaches.

He was of opinion, that when an eminence falls gradually from its summit towards the glacis of a place, works ought to be made one before another, with their flanks or flank ed angles sufficiently raised; that the most distant ought to cover all the rest, and draw its defence from them; and that they ought all of them to be built in such a manner, as to prevent an enemy from making a retreatment in the first, without being exposed to the fire of the second; or in the second, without being exposed to that of the third, and so on.

The glacis should as often as possible be composed of pebbles, or of stones covered with turf, since the besiegers can work but slowly in it when it is made, and the parapets thrown up in it by the pioneers, are apt to occasion their being killed or wounded, as the cannon-shot of the place striking against, scatter the stones, and make them fly in different directions.

He observes, that the bridges of his curtains do not interfere with the fire from his flanks along the faces of the bastions in the ditch, and he prefers that ditch which, by means of flanes, can be hilled or emptied at pleasure.

The construction of the Chevalier de Ville's method of fortifying is the following.

He begins inwardly, and conducts outwards. He makes his flanks equal to the demi-gorges, and each of them equal to a sixth part of the side of the figure or polygon on which he constructs. In the square and pentagon, he determines the flanked angle or failing angle of the bastion by a radius line; but in all figures and polygons of a greater number of sides than five, he makes it equal to a right angle, by describing a semicircle, as EGN on a right line, (fig. 10.) Enjoining the epaules E and N, thereby making a second flank, as D, C, H, which increases with the number of sides in the figure or polygon. The length A G, of the capital of the bastions is, in this case, equal to the gorge line C P, or the distance between the points where the flanks of the bastion meet the adjoining curtains, a circumstance which furnishes an easy method of finding the points of the bastions.

In constructing his casemates, or retired flanks and oil lions, he sets of from C and D, on the flanks E, E D, F, lines equal each to a third part of C E or D F, or of the demi-gorge, as D a, for influence, on D F. He also takes F b in the face H F produced, equal to D a, and then draws b c parallel to F a, to meet a right line joining a, and G the point of the opposite bastion. Then b c is the front of the orillon, when it is made square. But when he makes it round, he describes two arcs from b and e, as centres, with a radius equal to b c, and from their intersection as a centre through the points b, e, he describes the arc of his orillon.

The calculation of the lines and angles, according to his construction, may be made in the following manner.

If we suppose A B to be the side of a hexagon, the angle A O B of the centre will be equal to 60 degrees, and the angle A B S, or A B T, of the figure, equal to 120°. And as the flank is by the construction perpendicular to the curtain, the angle E C D of the flank is, of course, equal to 90 degrees. But as the flanked angle E G N is also equal to 90 degrees, the half of it, A G I, is equal to 45 degrees, and consequently the angle diminué A I G, being equal to half the excess of the angle of the polygon above the flanked angle, is equal to 15°. And the angle of the epaule is of course equal to 105°.

Wherefore, if A B be affined of a given length, whether equal to 120 toises, or otherwise, the capital A G of the bastion, and the gorge-line C P, which is equal to it, is easily found by the following analogy, and the isosceles triangle C A F.

As the line of the angle A C P, or A P C, half the excess of 180° above the angle of the polygon, or half the angle of the centre.

Is to the line of the angle of the polygon or centre

So is the flank of the bastion or

To the gorge-line C P, or capital of the bastion A G.

And the radiant line G I, in the oblique-angled triangle A G I, is found by this analogy.

As the line of the angle diminué A I G

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Is is to the fine of the angle GAI, or its supplement
OAI, half the angle of the polygon,
So is the capital AG of the baflion.
To the rafant line GI.
And the line AI is obtained from the fame triangle, by this
analogy.

As the fine of AIG the angle diminué
Is to the fine of A GI, half the flanked angle,
So is the capital AG of the baflion.
To the line AI.

From which, if there be taken the flank or demi-gorge,
there will remain the complement CI; which, taken from the
curtain CD, leaves the fecond flank DI. The comple-
ment CI is also easily found from the right-angled tri-
gle, ECI, by the following.

As radius
Is to the tangent of the angle C E I = 90° — the angle
diminué,
So is the flank EC, a sixth part of AB,
To the complement CI.
The fide GH of the exterior polygon is determined by
taking a fourth proportional to OA, AB and OA + AG.

The foregoing methods of construction have been called
the French manner, particularly those of Count Pagan and
Mr. Vauban, who borrowed from him the length of his per-
cpendicular, which is the principal part of construction, and
that on which all the other parts chiefly depend. Vauban's
method, however, has been chiefly followed on account of
its plainness and simplicity, with a single flank. It is pro-
per, nevertheless, to give the constructions of some of those
methods of fortifying that have been made use of in other
nations.

The Italians, who have not been anxious about making
the flanked angle, or angle of the baflion, either right or
obtuse, but prefer having it acute for the purpose of get-
ting a second flank on the curtain, have several methods of
fortifying delivered by their authors, amongst which that of
Sardi has been esteemed one of the best.

He begins inwards and contracts outwards, supposing AB
equal to 800 geometrical paces or feet (fig. 11.). Of these
he allows 150 for the demi-gorge AC or BD, and the fame
for the flank CE or DF, which he places perpendicularly
to the curtain CD, on which he takes an eighth part DI for
the second flank, making I the point in the curtain, from
which the rafant line drawn through E the extremity
of the flank or angle of the épaule, gives the faliant point
G of the baflion on the lengthened radius OA. And this
operation, continued round the figure or polygon, completes
the construction.

He makes a cafemate in each flank, capable of holding
three pieces of cannon, by letting off from the extremity
of the curtain on the demi-gorge, a line equal to a third part
of the flank, and the fame on the flank itself. And he
makes his orillons either square or round.

He places square cavaliers on the middle of his curtains,
of which the faces are parallel to the parapet of the ramp-
art, and 30 feet distant from the fame. In each of these
he puts 7 pieces of cannon, three of which look into the
field, and the other four towards the two adjoining baflions
to flank each breach as the besiegers may make in the
faces of them, and prevent them from giving the assfult.

The calculation of the principal lines and angles in Sardi's
construction, may be made in the following manner.

Since the interior line AB is by supposition equal to
800 geometrical paces or feet, and the demi-gorge AC,
and flank CE, each equal to 150 of thefe, the curtain CD
is equal to 500, and the fecond flank DI, which is the
eighth part thereof, is equal to 625. Consequently the
complement CI is equal to 417° 45 feet or paces.

But if we suppose AB to be the side of a hexagon, the
angle AOB of the centre will be equal to 60°, and the
angle AAB or ABT of the polygon will be equal to 120°.
And the angle ECD of the flank is by the construction
equal to 90 degrees.

The angle diminué CIE is therefore found from the
right-angled triangle ECI by this analogy.

As the complement CI
Is to the flank CE,
So is the radius
To the tangent of the angle diminué CIE, which is about
18° 55½. If this be added to the angle of the flank,
which is equal to 90°, we get 108° 55 for the angle CEG
of the épaule. And if the fide angle diminué of 18° 55 be
taken from the angle OAI, or half the angle of the
polygon, which is here equal to 60°, we get 41° 5 for the
angle AGI half the flanked angle. Consequently the
flanked angle is about 85° 10.

If to the complement CI we add the demi-gorge AC,
we get AI equal to 587½ such feet or paces, and the rafant
line GI is therefore found from the oblique-angled tri-
gle AIG by the following analogy.

As the fine of half the flanked angle A GI
Is to the fine of the angle GAI, or of half the angle of
the polygon,
So is the line AI
To the rafant line GI.

The capital AG of the baflion is also obtained from the
fame triangle by this analogy.

As the fine of half the flanked angle AGI
Is to the fine of the angle diminué AIG,
So is the line AI
To the capital AG of the baflion.

If to the curtain CD we add the demi-gorge AC, we
get the lengthened curtain AD, equal to 650 such feet or
paces, and from thence by means of the oblique-angled tri-
gle GAD the rafant line GD in the following manner.

As the sum of the lengthened curtain and capital AD, AG,
Is to their difference,
So is the tangent of half the fum of the angles AGD, ADG,
or of one quarter of the angle of the polygon,
To the tangent of half their difference, which is found
to be about 12° 31½. This taken from 36° one quarter of the
angle of the polygon, or 12°, leaves 17° 29½ for the
angle ADG, and added to the fame gives 42° 51 for the
angle AGD. Therefore,

As the fine of the angle ADG
Is to the fine of the angle GAD, or of half the angle of
the polygon,
So is the capital AG of the baflion,
To the rafant line GD.

The Italian writers on fortification feem fond of having
the flanked angles, or angles of the baflions acute, in order
that the faces of the baflions, on the fame side of the place,
may defend one another, and serve as flanks when the cafe-
mates and flanks are battered down or ruined. But the fecond
flank on the curtain is by this construction too small to
make the flanked angle always acute. To make it answer
this purpose, it would be an improvement of it to make the
fecond flank increase in length, as the number of the baflions
or of the fides of the figure increases.

It is perhaps worthy of remark, that the angle ADG
by
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by this constitution on a hexagon, exceeds that subtended by the true perpendicular of a hexagon by about 17° only.

The angles of the square and pentagon are too small for a second flank. And the Chevalier de Ville, whose construction much reprehends Sardi's in several respects, appears to have borrowed from him the idea of making his flanks equal to his demi-gorges. He takes care, however, to avoid second flanks in the square and pentagon, and in other figures to make them increase with the number of the sides of the figure.

The following is the construction of the Dutch method of fortifying according to Marolais.

Before he begins his construction he ascertains the magnitude of the flanked angle, or angle of the baflion, by adding 15° to half the angle of the polygon, which makes it in the square equal to 65°, in the pentagon equal to 69°, in the heptagon equal to 75°, in the heptagon equal to about 70° 17', in the decagon equal to 87°, in the dodecagon equal to 90°, which he also allows for in all figures or polygons of a greater number of sides.

He makes the curtain IK (fig. 12) equal to 36 rods of 12 Paris feet each, or 72 toises, the face of the baflion AF equal to 24 inches rods or 48 toises, making the ratio of the curtain to it a fegalateral one, or that of 3 to 2. He makes the flanked angle F MI equal to 40°, when he wishes to have only a single flank, in order that the demi-gorge MI may be to the flank in the ratio, nearly of 6 to 5, and equal to 35° only, when he intends to have a covered flank, making then the ratio of the demi-gorge to the flank about that of 7 to 5.

Let AB be an exterior side. Make the angle BAO equal to half the angle of the polygon. Bifect the same by the right line AP. Take the angle APE equal to 75° 30'. On the right line AE set off from A 48 toises for the face AF. From the epaule E draw the perpendicular FG, and produce GF indefinitely towards I, making at the point F an angle IMF of 50°. Draw through the point P, where the line FM meets the radius AO of an indefinite right line, MN, parallel to the exterior side AB, which will be a side of the inward polygon. Take the curtain IK, equal to 72 toises, and the line GH equal to it. Join KH, and on it take KL equal to the flank IF. Make the demi-gorge KN equal to the demi-gorge IM, and HB equal to GA. Draw the face BL, and the capital BN, which, being produced, will meet the capital AM also produced in the centre O.

The calculation of the principal lines and angles of the construction on the sides of a polygon fortified, according to Marolais's method, may be made in the following manner.

If we suppose AB to be the side of a hexagon, we have the angle of the centre equal to 60°, the angle of the polygon equal to 120°, and consequently OAB half the angle of the polygon equal to 60°. Wherefore OAE, half the flanked angle, is equal to 37° 30', which taken from OAB, half the angle of the polygon or 60°, leaves 23° 30' for the angle diminuèd EAB. But the angle of the flank is a right angle by the construction. If to this then there be added the angle diminuèd, we shall have 112° 30' for the angle AFI of the epaule or shoulder, from which if the angle IMF, which is equal to 50°, be taken, there will remain 62° 30' for the angle AFI. The angle AMF is 85°.

The capital AM of the баflion is found from the oblique-angled triangle AMF by this analogy. As the sine of the angle AMF is to the sine of the angle AFI, So is the face A FI of the баflion To the capital AM.

And the line IMF is found by this analogy. As the sine of the angle AMF is to the sine of the angle F AM, So is the face A FI of the баflion To the line IMF.

The flank IF is found from the right-angled triangle MIF by this analogy.

As radius
Is to the sine of the flank-forming angle IMF = 40°.
So is the line IF.
To the flank IF, which is equal to about 19 toises.
And the demi-gorge MI is found from the same triangle by this analogy.

As radius
Is to the sine of the angle IMF = 50°.
So is the line IMF.
To the demi-gorge MI, which is equal to about 22 toises, the double of which or 45 toises added to the curtain IK, which is equal to 72 toises, gives the interior MN equal to about 117 toises.

The exterior side AB is determined by means of the line AG, which is found from the right-angled triangle AGF, by this analogy.

As radius
Is to the sine of the angle AGF = 67° 30'.
So is the face AGF of the baflion, which is equal to 48 toises.
To the line AG, which is equal to about 44 toises, the double of which added to GH, that is, equal to 72 toises, gives 162 toises for the exterior side AB.

The second flank KE is determined by means of the complement EI, which is found from the triangle ETF, by either of the following analogies.

As the sine of the angle diminuèd I EF = 22° 30'.
Is to the sine of the angle E FI = 67° 30',
So is the slant IF.
To the complement EI.

Or, As radius
Is to the tangent of the angle E FI = 67° 30',
So is the slant IF.
To the complement EI, which is equal to about 45° 10', and which taken from the curtain, which is equal to 72 toises, leaves 26 toises for the second flank KE or IC.

The perpendicular distance of the intersection of the lines of defence, from the middle of the exterior side AB, is found by this analogy.

As radius
Is to the tangent of the angle diminuèd, which is = 22° 30',
So is half the exterior side AB.
To the perpendicular from it to the intersection of the lines of defence, which is therefore equal to about 32¼ toises.

This construction furnishes an easy method of working on the ground, when through interruptions from buildings, hedges, thickets, &c. and from the unevennesses and irregularity of the ground itself, a regular polygon cannot easily be described by finding the centre of the circumference of the circle. For such a polygon may be traced on the ground by means of the miter lines of the curtains and baflions, setting off first successively the angle of the polygon without any reference to the centre. This author, however, instead of making his flank equal to his perpendicular, as it ought to be, makes it fall short of the same by not less than 1 3½ toises.

There are other methods of construction delivered by Dutch writers, which, however, are hardly deserving of notice. And
as in all their methods, they make a second flank on the curtain, and for the most part draw at the same time the counter-scarp of the great ditch parallel to the faces of the balistons, they render the defence very defective. For the branches of the counter-scarp being thus parallel to the fuchiant lines, will, when produced, frequently meet the curtains, and will of course cover the greatest part of the ditch itself, from the view of the flanks of the balistons. And as the principal part of the ditch is thus fien by the second flanks only, which are easily mined, the entrance into it is rendered easy to the besiegers.

The following is the construction of the Spanish method of fortifying.

Take the interior side A B (fig. 1.) equal to 120 toifes. From A to C, and B to D, let fall 20 toifes or a fith part of A B, for each of the demi-gorges A C, B D. On perpendiculurs to A B at the points C, D, take C E, D F, equal repectivefly to AC, BD, or to 20 toifes each, or a fith part of A B. Let O be the centre of the circle, which circumference the polygon, of which A B is a side. From D through F, and C through F, draw right lines to meet the radii OA, OB, of the said circle, produced in the points G, H. Then E G, F H will be the oppofite faces of the balistons C E F Q, D F H R, and A G, B H their capitals. And the fame construction continued on the other fides A M, M T, T V, V N, N B, completes the operation.

The calculation of the principal lines and angles of this construction is made in the following manner.

Since A B is equal to 120 toifes, and A C, B D, each equal to 20, the curtain C D is equal to 80 toifes. And since C E, D F, are each equal to 20 toifes, or the fith part of A B, and also perpendicular to A B by the construction, C D is to C E as four to one, and as radius to the tangent of the angle C D E, which is therefore equal to about 14° 2'. Wherefore the angle C E D is equal to about 75° 58', and the angle C E G of the epaule or shoulder is equal of course to about 104° 2'. These angles, therefore, are the fame in all polygons.

But the flanked of confluence, with the angles of the polygons.

Now, if we fuppose A B to be the side of a hexagon, we have the angle A O B of the centre equal to 60°, and the angle M A B or A B N of the polygon equal to 120°. Confequently half the flanked angle O G D or A G D, which is equal to the excess of O G H or O A B, half the angle of the polygon, above the angle diminute A D G or C D E, is equal to 45° 58'; and the whole flanked angle, or angle P G E of the balifon, is equal to 91° 56'.

The capital A G of the balifon, is found from the oblique-angled triangle A G D, by this analogy.

As the fline of half the flanked angle A G D, which is 45° 58',

is to the fline of the angle diminute A D G = 14° 2',

So is the lengthened curtain A D, which is 100 toifes,

To the capital A G of the balifon, which is equal to about 33.73 toifes.

And the reftant line or line of defence D G, is found from the fame triangle by this analogy.

As the fline of half the flanked angle A G D = 45° 58',

is to the fline of the angle D A G = 120°,

So is the lengthened curtain A D, which is 100 toifes,

To the reftant line or line of defence D G, which is equal to about 120.46 toifes, or 120.5 toifes nearly.

But D E is equal to \[ CE + CD = \sqrt{20^2 + 80^2} = 4\sqrt{425} \] toifes = to 83.86 toifes nearly. Wherefore the face G E of the balifon is equal to 37.6 toifes nearly.

The gorge-line C Q is found from the ifofeles triangle C A Q, by the following analogy.

As the fline of the angle A C Q = half the angle of the centre

is to the angle of the polygon C A Q,

So is the demi-gorge A C, which is 20 toifes.

To the gorge-line C Q, which in a hexagon, as this figure is fupposed to be, is equal to about 34.64 toifes.

The line O G being equal to about 173.73 toifes, the exterior side G H, when A B is the side of a hexagon, will also be equal to about 173.73 toifes. But G H is always determined by taking a fourth proportional to O A, A B, and O G.

The perpendiculur distance K L of the interfeftion of the lines of defence, from the exterior side G H, is found by this analogy.

As radius L is to the tangent of the angle diminute L G K = 14° 2',

So is G L, or the half of G H, the exterior side.

To the perpendiculur K L, which in the hexagon, as this figure is fupposed to be, is equal to about 19.2 toifes, falling short of the flank C E by about 0.5 of a toife, or eighteenths of a toife.

The Spaniards, who are rather partial than otherwife to obtufe flanked angles, have no second flank on the curtain, but always contract their fortifications with a reftant, and never with a ficitant line of defence, not minding whether the flanked angle or angle of the balifon be acute, right, or obtufe. Their mode of construction, except as to the second flanks, and the making of the flanked angle right, is the fame with that of the Chevalier de Ville, above defcribed, which being compounded of the Italian and Spanish methods, has on that account been called the compofed draught, or the compofed method of construction.

Let A B (Plate VII. fig. 1.5.) be the side of a regular hexagon inscribed in a circle, and equal to 160 toifes. Set off from its extremities A and C on it A C, B D as demi-gorges, and each equal to an eighth part of A B, or to 20 toifes. From the points C and D on right lines perpendicular to A B take C E, D F, as flanks each equal to 20 toifes, or an eighth part of A B also. Take the curtains C I, D K, from the points C, D, and A, B, each equal to 40 toifes, or a fourth part of the interior side A B; and from the points I, K, on right lines, drawn perpendicularly to A B inwards, take I L, K M, for the retired flanks, each equal to 20 toifes, or the eighth part of the interior side. Join the points L, M, by drawing L M for the retired curtain. From the extremities L, M, thereof through the points K, I, draw the right lines I, K, M, which being produced, will pass through the outward extremities E, F, of the flanks C E, D F, and will meet the lengthened radius O A, O B, in the points G, H, which will determine the faltant points of two of the balifons. And a similar operation continued quite round on the other fides of the balifon, will complete the construction.

As the foregoing figure is fupposed to be a regular hexagon, the angle of the centre is equal to 60°, and that of the polygon to 120°. And as M L is to L I, as 40 to 20 or 2 to 1, the natural tangent of the angle diminute L M I, or M G H to unity, as radius is equal to \(\frac{1}{4}\) or to 0.500,000, which is nearly equal to the natural tangent of 20° 34'. If this angle be taken from 60°, half the angle of the polygon, there will remain 33° 26' for half the flanked angle, or half the angle of the balifon. The flanked angle therefore, or the angle of the balifon, is in a hexagon equal to 60° 34'.
To the line GI, which is equal to 94.31 toises nearly.

And the capital AG of the balloon is found from the same triangle by this analogy.

As the line of AG, half the flanked angle = 33° 26'

Is to the line of the angle diminute AG 43° 34'

So is the line AI, which is equal to 60 toises,

To the capital AG of the balloon, which is equal to about 48.704 toises.

But the line IM is equal to \( \sqrt{1L^2+LM} = \sqrt{23^2+42^2} = 49.59 \) toises nearly.

But EI is equal to 1 M. Wherefore GE, the face of the balloon, being equal to GI - EI, is equal to about 49.59 toises, or 49.06 toises nearly.

The short or little line of defence GM or HL, being equal to GI + IM, is equal to 94.31 + 49.72 toises, or 144 toises nearly.

The lengthened radius OG, and consequently the exterior side GH, when AB is the side of a hexagon, is equal to 165 + 44.72 toises, or 209.72 toises.

The perpendicular distance of the intersection I, of the lines of defence, from the exterior of G H, is found by either of the two following analogies.

As radius

Is to the tangent of the angle diminute i GH = 26° 34',

So is the exterior side GH, or 102.36 toises,

To the perpendicular distance of i from the same.

Or, As radius

Is to the line of the angle diminute i GH = 26° 34',

So is the little line of defence GM = 132 toises,

To the perpendicular distance of the point i from GH,

which is equal to about 62.160 toises.

This method was adopted for the purpose of constructing on a large front, and thereby increasing the number of bastions. And to keep the lines of defence G M H L, within mischief, a curtain LM retired inward, is made equal to a fourth part of the interior side A B, and opposite to the middle thereof. This manner of fortifying has been called the order reinforce or re-inforced order, concerning which several Italian and Spanish authors have written large treatises. Like most other writers on fortification, who have delivered different methods of construction, they very ably make their angle diminute invariably the same in all polygons, without assigning any good reason for doing so. Drawn from the natures or properties of the polygons themselves, the facility or difficulty of embracing them respectively, or from their relative degrees of capability of defence. In this method, the perpendicular distance of the intersection i of the lines of defence, from the exterior side GH, is more than thrice the length of the flank CE or DF.

Of Coehorn or Koeaam's methods.

The famous Minno, baron of Koeaam, who took many of the places, which the celebrated marshal Vauban had fortified, published three methods of construction, the first for a hexagon, the second for a heptagon, and the third for an octagon. The publication of his treatise on fortification however took place before he had acquired that great experience, which justly procured him the reputation of being one of the first engineers, that has ever appeared in Europe; and the methods delivered in it are not reducible to practice. That he afterwards thought so highly is evident from the towns which he fortified. For if, after acquiring experience in the attack of places he had really been of opinion that the methods he had published, were capable of making such a prodigious resistance or defence as he endeavoured in his book on fortification to show, that they were, it is a circumstance difficult to be accounted for, that he never once thought of using them, when he had frequent opportunities of doing so. It ought also to be remembered, that his system of fortification was published before the method of firing en ricochet was either practised or invented.

In his first method the works occupy twice as much ground as they do in Mr. Vauban's, and being entirely of earth, low, and liable to be easily surprized, would require as many men, at least, for their defence. His second and third methods are, in fact, impracticable, as the fortification in each of them takes up five times as much ground as the town or place it surrounds.

This being the case, we will just give a general description of them. In all the three he begins inwards and constructs outwards. The first he applies to a hexagon and supperposes the surface of the water to be only about four feet lower than the level ground. In this he constructs from an interior side of 150 toises, from the extremities of which he fets off on the fame 29 toises for each of the demi-gorges and 80 toises on the lengthened radii of the hexagon for the capital of each of the balloons. He thus leaves 72 toises for the length of his curtain. From the extremities of the interior side he takes, on the lengthened radii respectively, 40 toises for the points of intersection of the higher faces of the balloons, which are also equal each to 40 toises, and parallel to the lower faces that are in the lines of defence. The space between the lower and higher faces of the balloons is a dry ditch, the bottom of which is only about six inches above the level of the water in a wet ditch. Behind the lower parapet there is a balonnette of three feet and a rampart of five, and under this ramrart is a stone gallery, that runs from one end of it to the other, and is divided into several apartments, which are shut with doors. There is also a gallery, which goes from the falant angle formed by the lower faces to that formed by the higher with loop holes at small distances from one another, looking into the dry ditch. There are likewise rows of palisades placed parallel to the higher face at the distance of four toises from them.

The great ditch is 24 toises broad, and its counterescarp is parallel to the lower faces of the balloons. The demi-gorges of the ravelin are each equal to 29 toises, and the faces each to 45 toises. The dry ditch between the lower and upper faces of it is 16 toises broad. The rampart is 28 feet broad, the balonnette three, and the parapet 25. The lower faces are parallel to the higher ones.

The angle diminute, or the angle formed by the exterior side, and either line of defence, is in this method equal to 24° 30° 48'.

His second method he applies to a heptagon, and supperposes the level of the ground to be only about three feet above that of the surface of the water. In it he constructs outwards from an interior side of 126 toises in length, from the extremities of which he takes on the fame 30 toises for each of the demi-gorges. On the lengthened radius of the heptagon he fets off 72 toises for the capital of each of the balloons, at the extremities of which he draws eight lines forming with the said capitols angles each of 40°, and on these lines he fets off 60 toises for the faces of the balloons respectively. From the fallant angles of the balloons as centres with radii equal to the distance from the same to the extremities of the demi-gorges 30 toises distant from those of the interior sides he describes arcs, in which he fets off respectively chords equal each to 30 toises, and on these chords describes the mean flanks which are arcs of 60°.

The outline of his higher flank is 33 toises distant from...
that of the mean, and this flank is an arc described from the
fame centre, that the mean flank is described from, having
its chord equal to 40 toises.

The dry ditch round the body of the place is 20 toises
broad before the faces of the bastions, to which its coun-
tercarp is parallel. There is a wet ditch before his tenaille's
10 toises broad with two bridges at each end near the
millions, the one of which leads directly across it and the
other along the face of the bastion.

The faifant angle of the ravelin is 125 toises distant
from the curtain of the body of the place and is of 70
degrees of magnitude. The faces are each 50 toises long, and
the faces of the redoubt in it are 16 toises distant from the
faces of the ravelin, and each 14 toises long. The wet ditch
before the lower faces of the ravelin is 24 toises broad, and
the work beyond that ditch, which he calls the second
countercarp, is 20, and parallel to the ditch.

The faifant angle or angle of the bastion in this method
is equal to 85°, and the angle diminué or the angle formed
by the exterior side and either line of defence is equal to
twenty-four degrees and two sevenths. In his first method
the angle of the bastion or flanked angle is equal to 70°
4° 24'.

He applies his third method to an octagon, of which
the side is equal to 110 toises, and from which he constructs
outwards; from its extremities he sets off 21 toises for each
of the demi-gorges. On the lengthened radii, or radii of
the octagon produced, he sets off from the said extremities
of the interior side 64 toises for the capitals of each of the
bastions, the faces of which he supposes to be each equal
to 54 toises, and the faifant or flanked angle equal to 85°.
He thus makes his curtain equal to 68 toises.

In his first and second methods he has three flanks includ-
ing that of the tenaille. But in this he has only two, the
lower of which is determined or found by describing an arc
through the extremity of the tenaille from the faifant angle
of the opposite bastion as centre and letting off from the
said extremity in the said arc a chord equal to 20 toises, on
which an arc of 60 degrees is described for the flank.
The upper flank is described from the same centre,
that the lower one is described from through one ex-
tremity of the curtain, and its chord is equal to 30 toises.
The wet ditch before the body of the place is 20 toises
broad, and its countercarp is parallel to the faces of the
bastions.

The capital of the detached bastion is equal to 100
toises, its faces are directed towards the faifant angles of
the inner bastions. The dry ditch between the lower and
higher faces of the detached bastions is 20 toises broad;
and the higher faces are parallel to the lower, and each of
them 31 toises long. The ditch before the detached ba-
tions 24 toises broad. It is evident, that in this third method
of Coehorn the angle diminué or the angle formed by the
exterior side and either line of defence is equal to 25 de-
grees. For since the angle of the centre in an octagon is
equal to 45°, that of the octagon is equal to 135°, from
which, if the flanked angle, that by the construction is
equal to 85°, be taken, we get 50° for the double of the
angle diminué, which is of course equal to 25°.

Of Mr. Belidor's methods.

This author delivers three methods of construction, the
first he applies to an octagon, of which the side is equal to
200 toises. In the three he begins outwards and contracts
inwards. In the first he makes the perpendicular to the
exterior side equal to 50 toises, the faces of his bastion
equal each to 70 toises, and he finds his flanks in the same
way with Mr. Vauban in his first method. He makes
his bastion with flanks each to about 26 toises. On the
line joining the extremities of these flanks he constructs in-
ward, erecting a perpendicular to the middle thereof equal
to 13 toises, through the inner extremity of defence and
takes on them the faces equal each to 22 toises. The
parts of the lines of defence from their intersection to the
points where they terminate the flanks, are each equal to
14 toises. The dry ditch before this front is 10 toises
broad at the inner extremities of the bastions, and its coun-
tercarp produced terminates at the opposite shoulders.
He connects the flanks of the bastions with the curtains
or lines joining the faces of the inner front by means of
works in the form of arcs called ram's-horns, which are
described from the middle points of the said faces as centres
with a radius of 25 toises. The faifant angle of the re-
doubt in his bastion is in the intersection of the two ad-
joining curtains produced, and the faces of it terminate on
those of the inner front within three toises of the epaules
or shoulders. The ditch before it is 3 toises broad. It has
a stone wall in the faces from three to four feet thick with
loopholes. Mr. Belidor adds no outworks to this method of
construction, which has certainly the advantage of all those
with detached bastions. The retracements within are capa-
cible of a good defence, but occupy too much ground, par-
ticularly the ditches, that might be better disposed of. The
flanks of such large bastions as his are too small. The
great ditches are too large, being 20 toises broad at the faifant
angles of the bastions with its countercarp directed to-
wards their shoulders.

In this method his angle diminué or the angle formed by
the exterior side and either line of defence is equal to 26°
35° 45° and of course the angle of his bastion or the flanked
angle, as the construction is applied to an octagon, is equal
to 81° 52° 12°.

His second method of construction he also applies to an
octagon, of which the exterior side is equal to 200 toises,
the perpendicular to which, from the middle point thereof,
he makes equal to 55 toises. The faces of his bastions,
which are detached, are each equal to 70 toises, as in his
first method. And the flanks as well as in the first are
found in the same way as Mr. Vauban's.

The right line, that passes through the inner extremities
of his bastion, serves as an exterior side for constructing
the inward polygon on, the perpendicular to which, at the
middle point thereof, is equal to 5 toises, through the inner
extremity of which the lines of defence are drawn. On
these the faces are set off, each equal to 24 toises; and the
flanks are chords of arcs described from the opposite shoul-
ders of the detached bastions as centres.

The inward polygon is in fact nothing else than a strong
wall, behind the curtain of which, and at the distance of
about 18 feet from it, there is an epennement or a parapet
of earth 3 toises thick. And within the bastions there are
cavaliers, of which the fronts are circular arcs, described
with a radius of from 21 to 24 toises. Their flanks are
each equal to 7 toises, and their gorges to 32 toises each.
The countercarp of the ditch before this inner polygon
is distant from it at the faifant angles, and is parallel to the
curtain.

His tenailles, called ram's-horns, touch the outer lines of
defence within three toises of the epaules or shoulders of
the detached bastions, and are so described as to meet the
said lines of defence inwards, beyond their intersection in the
points, where the countercarp of the inner ditch meets the
fame.
The outline of the curtain between the ram's-horns is 9 toises beyond or without the inner ditch.

The exterior line, from the retreatment within his detached bastion is constructed, runs across the same, and meets the faces thereof about 20 toises from the caponiers, or shoulders, the perpendicular to which line at the middle point thereof is equal to 17 toises. Through the inner extremity of this perpendicular the lines of defence for the retreatment are drawn. On these lines, from the faces of the bastion, those of the retreatment are set off equal each to 20 toises. The chord, on which the orillon is described, is equal to 5 toises, as is also that on which the retired flank is described. Both are made according to Mr. Vauban's method. The circular curtain of this retreatment, and the rounded part of the ditch adjoining it, are described from the falant angle of the inner construction next to it, with a radius of 25 toises. The great ditch before the falant angles of the detached bastions is 20 toises broad, and as it is supposed to be dry, Mr. Belidor made a caponiere from the curtain between the ram's-horns to the ravelin of about 18 or 20 feet wide, the parapets of which he made terminate on both sides in a slope or glacis.

The capital of the ravelin he makes equal to 66 toises, and that of the redoubt within it equal to 30 toises. The faces of the ravelins are directed towards those of the retreatments within the detached bastions, and those of the redoubt within it to the shoulders of the said bastions. The batteries in the ravelin are retired 8 toises back from the faces of it. The ditch in front of the ravelin is 12 toises, and the breadth of that before the redoubt is equal to 7 toises.

The demi-gorges of the lunettes are each equal to 25 toises, and their faces are perpendicularly directed towards those of the ravelin and detached bastions. The ditch before them is 8 toises wide, and the batteries in them are retired 8 toises back from their faces, and are each of them 15 toises long. The covert-way is 6 toises broad.

In this method the angle diminué, or the angle formed by the exterior side and either line of defence, is equal to 25° 48' 39'; and as the construction is applied to an octagon, the angle of the bastion, or the flanked angle, is of course equal to 27° 23' 42'.

It is manifest that in this construction the perpendicular to the exterior side, or of the great polygon, is much longer than it ought to be, since it exceeds the true perpendicular belonging to a polygon of 30 sides. For the angle diminué, which it gives, is greater than the true angle diminué belonging to a polygon of 30 sides, by upwards of one degree. And the angle of the bastion, or flanked angle, falls short of the real flanked angle in a polygon of 30 sides, by not less than 3°. The bastions are thereby made by far too large and extensive. The great ditch appears also to be too wide, as the excavation of it will furnish more earth than what is wanted for raising the ramparts. The works indeed, taken altogether, are too expensive to be erected. For it would require almost a whole army to defend them, besides such a prodigious quantity of stores and ammunition, as cannot be allotted for the service or defence of any one place.

Mr. Belidor applies his third method of construction, as he does his first and second, to an octagon, of which the exterior side is equal to 200 toises. But he makes the perpendicular to it at the middle point thereof equal only to 40 toises, which is very nearly indeed equal to the true perpendicular of an enneagon of the same exterior, and therefore comes nearer to the true perpendicular of an octagon than that which has been described for it by any other writer on fortification. On this account we will give the construction of part of the body of the place on an octagon according to this method.

Let AB (Plate VIII. fig. 15.) be equal to 200 toises inside of an octagon. Bisect AB in the point C, and draw CD perpendicular thereto. From C to D let fall to D, equal to 40 toises, and from the extremities A, and B, of the exterior side AB, through the point D, draw the lines of defence. On them take AE and BF for the faces of the bastions, equal each to 55 toises. The parts DA, DB, between the intersection, D, of the lines of defence, and the broken parts of the curtain, take each equal to 35 toises, and the length of each of the broken parts remains equal to 25 toises. The orillon is equal to 9 toises, and is part of a flank found according to Mr. Vauban's method. The flanks are retired 8 toises, and are arcs of 65° each. The outlines of the ram's-horns are 13 toises distant from one another. The palisades at their extremities are each 3 toises wide. The outermost or lowest is described with a radius of 30 toises, and the other is described from the same centre. By making the same construction on two other sides of the octagon, the positions of the other faces, AG, BH, of the bastions is determined as well as the magnitude of the flanking angle of each. He places cavaliers in the gorges of the bastions.

The capital of his ravelin is 44 toises. The demi-gorges of it are each equal to 31 toises, and its flanks, which are directed towards the shoulders of the bastions, are each of them equal to 9 toises. The ditch before the ravelin is 10 toises wide, and the covert-way is 6 toises broad.

The glacis before the flanking angles of the bastions is 15 toises broad. The demi-gorges of the places of arms are each equal to 26 toises, and those of the redoubts or stone walls within them to 20. And the faces are parallel to the opposite demi-gorges. He makes arrows and detached redoubts after the manner of Mr. Vauban, but gives flanks to his arrows, which are parallel to the palisades of 10 toises wide, that lead to them.

In this his third method of construction, the angle diminuit, or the angle BAC, or ABD, formed by the exterior side and either line of defence, is equal to 21° 48' 5", which differs from the true angle diminuit of an enneagon by about 3 minutes only. And as it is applied to an octagon, the angle of the bastion, or the flanked angle, is of course equal to 0° 23' 59'.

It must be allowed that this construction for the body of the place is good. The ram's-horns are unquestionably well contrived, and are much preferable to tenailles, as they cannot be enfiladed from any one place, as they refit better. by their bending or curvature outwards, the enemist's batteries, and render the flanks much superior to any batteries that the besiegers can erect against them. Like a mere constructor on paper, however, he makes so many outworks, that they occupy a vast extent of ground, cannot be defended but by a very numerous garrison, and uncommonly large supply of ammunition, artillery, and provisions, and cannot be erected but at an immense expense.

The learned and ingenious Mr. Ozanam has given four methods of construction, in all of which he begins inwards, and fortifies outwards, from an interior side of 120 toises, and at the same time places or takes his flanks on right lines drawn from the centre of the polygon through the extremities of the demi-gorges set off on the interior side, or on the same.
CONSTRUCTION.

has sides. In the square the demi-gorge is therefore equal to 24 toises, in the pentagon to 25, in the hexagon to 26, in the heptagon to 27, and so on to the decagon, in which the demi-gorge being equal by this rule to 30 toises, he makes it continue of this length in all higher polygons. He makes each flank equal to four times as many toises as the number of the sides of the polygon, allowing 16 toises for it in the square, 20 in the pentagon, 24 in the hexagon, 28 in the heptagon, and 30 on to the decagon, where the flank being by this rule equal to 40 toises, continues of that length in all higher polygons.

The angle formed by right lines from the salient angle, and either shoulder or epaule of his bastion, he calls the flank-forming angle.

The following is a table of the lines and angles of a fortified polygon, from the square to the dodecagon, according to his first method of construction, the inward or interior side being equal to 120 toises.

<table>
<thead>
<tr>
<th>Polygons</th>
<th>Sides.</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle of the centre</td>
<td>90° 0'</td>
<td>72° 0'</td>
<td>65° 0'</td>
<td>51° 26'</td>
<td>45° 0'</td>
<td>40° 0'</td>
<td>36° 0'</td>
<td>32° 44'</td>
<td>30° 0'</td>
<td></td>
</tr>
<tr>
<td>Angle of the polygon</td>
<td>90° 0'</td>
<td>108° 0'</td>
<td>120° 0'</td>
<td>128° 34'</td>
<td>135° 0'</td>
<td>140° 0'</td>
<td>144° 0'</td>
<td>147° 16'</td>
<td>150° 0'</td>
<td></td>
</tr>
<tr>
<td>Flank-forming angle</td>
<td>14° 2'</td>
<td>13° 1'</td>
<td>11° 51'</td>
<td>10° 36'</td>
<td>9° 21'</td>
<td>8° 44'</td>
<td>7° 50'</td>
<td>7° 22'</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Angle of the flank</td>
<td>120° 36'</td>
<td>112° 59'</td>
<td>105° 7'</td>
<td>102° 28'</td>
<td>100° 39'</td>
<td>99° 16'</td>
<td>98° 32'</td>
<td>97° 28'</td>
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<td></td>
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<tr>
<td>Angle diminué</td>
<td>9° 42'</td>
<td>13° 19'</td>
<td>16° 49'</td>
<td>20° 14'</td>
<td>23° 46'</td>
<td>27° 16'</td>
<td>30° 43'</td>
<td>33° 49'</td>
<td>31° 16'</td>
<td></td>
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<tr>
<td>Angle of the epaule</td>
<td>135° 40'</td>
<td>126° 18'</td>
<td>124° 56'</td>
<td>127° 21'</td>
<td>125° 14'</td>
<td>127° 55'</td>
<td>129° 59'</td>
<td>129° 21'</td>
<td>128° 54'</td>
<td></td>
</tr>
<tr>
<td>Flanking angle</td>
<td>160° 36'</td>
<td>153° 22'</td>
<td>146° 22'</td>
<td>139° 32'</td>
<td>132° 28'</td>
<td>125° 28'</td>
<td>118° 34'</td>
<td>118° 22'</td>
<td>117° 28'</td>
<td></td>
</tr>
<tr>
<td>Flanked angle</td>
<td>70° 36'</td>
<td>81° 22'</td>
<td>86° 22'</td>
<td>88° 6'</td>
<td>87° 28'</td>
<td>85° 28'</td>
<td>82° 34'</td>
<td>85° 38'</td>
<td>87° 28'</td>
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<tr>
<td>Demi-gorge</td>
<td>Toises. Feet.</td>
<td>24°</td>
<td>25</td>
<td>26</td>
<td>27</td>
<td>28</td>
<td>29</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
<tr>
<td>Curtain</td>
<td>72</td>
<td>70</td>
<td>68</td>
<td>66</td>
<td>64</td>
<td>62</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>Flank</td>
<td>16</td>
<td>20</td>
<td>24</td>
<td>28</td>
<td>32</td>
<td>36</td>
<td>40</td>
<td>40</td>
<td>40</td>
<td>40</td>
</tr>
<tr>
<td>Great line of defence</td>
<td>117° 3'</td>
<td>117° 5'</td>
<td>119° 0'</td>
<td>120° 3'</td>
<td>122° 5'</td>
<td>126° 0'</td>
<td>129° 0'</td>
<td>127° 0'</td>
<td>125° 4'</td>
<td></td>
</tr>
<tr>
<td>Face of the bastion</td>
<td>35</td>
<td>37</td>
<td>40</td>
<td>41</td>
<td>42</td>
<td>45</td>
<td>48</td>
<td>52</td>
<td>50</td>
<td>49</td>
</tr>
<tr>
<td>Capital of the bastion</td>
<td>28</td>
<td>33</td>
<td>39</td>
<td>46</td>
<td>53</td>
<td>61</td>
<td>69</td>
<td>67</td>
<td>67</td>
<td>3</td>
</tr>
<tr>
<td>Little radius</td>
<td>84</td>
<td>102</td>
<td>112</td>
<td>138</td>
<td>156</td>
<td>175</td>
<td>194</td>
<td>217</td>
<td>231</td>
<td>5</td>
</tr>
</tbody>
</table>

The following is this construction on a hexagon, of which the exterior side is equal to 120 toises.

Let A, B, C, F, D (fig. 16.) be a regular hexagon, inscribed in a circle, of which the radius, A O, is equal to 120 toises. From the extremities A and B, set off A L, B M, for demigorges, equal each to 20 + 6 or 26 toises. In like manner set off A P, C Q, B a, D b; C T, E V, E e, F Y, F Z, D X; equal each to 26 toises. From the centre O, through the points, L, M, a, P, Q, T, V, e, Y, Z, X, draw the right lines O L, O M, O a, O e, O c, O Q, O P, O T, O V, O Y, O Z, O X, equal each to 6 x 4, or 24 toises. From the points L, M, through the points K, I, draw right lines to meet the radius O B, O A, lengthened or produced in the points H, G. From the points a, b, through the points c, d, draw right lines in like manner, and so on round the figure. This operation will determine the salient angles of the bastions, and all the parts of the construction.

The calculation of the different lines and angles in this construction may be made in the following manner.

Since A B is equal to 120 toises, if from it there be taken the demi-gorge A L, or B M, which is equal to 26 toises, there will remain 94 toises for the lengthened curtain, A M, or B L, from which, if 26 toises be taken, we get the curtain L M, equal 68 toises. But as this figure is a hexagon, the angle of the centre is equal to 60°, and the angle of the polygon to 120°. The little radius is also of course equal to 120 toises.

The angle, I L M, of the flank, or its equal, A L O, is found by the means of the following analogy.

As the sum of the sides O L + A L = 145 toises, Is to their difference O L - A L = 94 toises, So is the tangent of half the sum of the angles A L O, A O L = 60°, To the tangent of half their difference, which is equal to about 48° 7'. This angle added to 60° gives 108° 7' for the
CONSTRUCTION.

the angle L M of the flank, and taken from 60° leaves 
11° 57; for the flank-forming angle A O L, or A O I.

In like manner the angle diminui, L M I, or M G H, is 
found from the oblique-angled triangle L M I, by means of this 
analogy.

As the sum of the sides L M, L I, which is equal to 92 
toises,

13° to their difference, which is equal to 44 toises.

So is the tangent of half the sum of the angles L M, 
L M I = 35° 56½°,

To the tangent of half their difference, which is equal to 
about 10° 27½°. This angle, taken from 35° 56½°, leaves 
about 1.9° 49½ for the angle diminui L M I, or M G H,

This and added to 35° 56½ gives about 55° 4' for the angle 
L M I; consequently the angle G I L of the epaule is equal 
to 124° 56'. And if 33° 28½, which is equal to twice the 
angle diminui, be taken from 180° we get 146° 24', for the 
flanking angle G I H, or I I K. Double the angle diminui, 
or 33° 28½, taken from 120°, the angle of the polygon 
leaves 86° 22' for the flanking angle, or angle of the bafton.

The angle diminui, 16° 49½, taken from 108° 18', the angle 
of the flank leaves 91° 18½ for L K, or L I H, the inner 
or inward flanking angle.

The line of defence, G M, is found from the oblique- 
angled triangle, A G M, by means of the following analogy.

As the sum of A G M, half the flanked angle, or 43° 11½, 
I, to the sine of the angle of the garge, G A M = 120°,
So is the lengthened curtain A M = 94 toises.

To the line of defence G M, which is equal to about 119 
toises.

And the capital, A G, of the baftion, is found from the 
false triangle, by means of this analogy.

As the line of A G M, half the flanked angle, or 43° 11½, 
I, to the sine of the angle G M, A M = 109° 49½.

So is the lengthened curtain A M = 94 toises.

To the capital A G of the baftion, which is equal to 
about 30½ toises, to which, if we add the little radius O A, 
which is equal to 120 toises, we get 150½ toises, for the 
great radius O G, to which the exterior side, G H, is equal, 
as the figure is a hexagon. And in every polygon, the 
exterior side, G H, is a fourth proportional to the little 
radius O A, the great radius O G, and the interior side 
A B.

The face, G I, of the baftion, is determined by finding the 
line I M from the oblique-angled triangle, I M L, by this 
analogy.

As the line of the angle diminui I M L = 16° 49½, 
I, to the sine of the angle I M L of the flank = 108° 17½,
So is the flank I L, which is equal to 24 toises.

To the line I M, which is equal to about 79½ toises, and 
when taken from I M, the line of defence, leaves about 40½ 
toises for G I, the face of the baftion.

The angle A O B is called the angle of the centre.
The angle B A C is called the angle of the polygon.
The angle N G I is called the flanked angle, or angle of 
the baftion.
The angle I I K, or G I H, is called the outward flanking 
angle.
The angle G I L is called the angle of the epaule or 
shoulder.
The angle L M I is called the angle of the flank.
The angle A O L, or M G H, is called the angle diminui.
The angle A O L is called the flank-forming angle.

P N G I L is called a baftion.

A P, or A L, is called the demi-gorge of the baftion.
The line joining the points P, L, is called the gorge of 
the baftion.

The angle I K L, or I L H, formed by the flank I L, 
and the line of defence L H, is called the inner flanking 
angle.

A B is called the inward or interior side.
G H is called the outward or exterior side.
O A is called the little radius.
O G is called the great radius.
I L, or K M, is called a flank.
I M is called the curtain.
A M, or L B, is called the lengthened curtain.
G M, or I L H, is called a line of defence.
A G is called the capital line, or capital of the baftion.
A I, or H K, is called the face, or point of the baftion.
The flank I L is called right flank, when it makes a right 
angle with the curtain; oblique flank when it makes an 
oblique angle with the same; and acute flank when it 
makes an acute angle with the curtain; as it does by 
Errard's method in figures up to the octagon. When 
the orillon is rounded or formed by the arc of a circle, it is 
called a round orillon, and when it is rectilinear, or formed by 
the face of the baftion, produced a few toises beyond the 
epaule, and a right line drawn from the extremity of the said 
prolongation, either parallel to the flank, or nearly so, it is called a 
fluent orillon. It is made for the purpose of covering part 
of the flank, which for that reason, or in order to be the 
more effectually covered, is taken a few toises inwards from the 
flank itself towards the centre of the baftion, and is generally 
made in an arc of a circle, though it would be better in a 
right line, or on the chord of an arc. It is on this account called 
the retired, or covered flank, and sometimes the eunatum, and 
place-bofts. And its depth, or enforcement, on the line of 
defence, produced beyond its intersection with the 
curtain, as well as its distance from the outside of the orillon, 
is called the retrace or retracement of the flank, or the platform 
of the eunatum.

The line Q S is called flank, because it defends the face 
G N of the opposite baftion. For, in fortification, to flank 
has the same meaning or signification with the phrase to 
defend. When the line Q S is not compos'd of the face 
G N of the baftion, and a prolongation thereof to the angle 
Q of the flank, it is called flank-fibant, because a mufketer, 
at its extremity Q, can fire, or ftifer, as the French 
term it, at or against any part of the face G N. Hence the 
line Q S, drawn from the said extremity Q of the flank, is 
called the flant-line of defence, and sometimes only the 
flaunt-line. It is also called the great line of defence. But 
when in the face G N of the baftion produced, meets the cur-
tain Q P, in any point, R, between the points Q and P, or 
in any point R nearer to the said baftion, the line G R is 
called the reftant-line of defence, or simply the reftant-line, 
and also the flant-line of defence, being shorter than the line 
Q S, because, a mufketer cannot from the point R fire at or against 
any part of G N, the face of the baflion, but can only rafe 
or fire along it. The part Q R of the curtain intercepted 
between the lines G Q, G R, is called the second flank, as 
also the fire or the curtain, because from every point in it, 
except the extremity R, one may flout or fire against every 
part of the face G N. Second flanks are not always, nor 
indeed frequently, made. And when there are none, there 
are no flaunt lines, but only reftant-lines of defence, in which 
case the flanks are called reftant flanks, because from their 
extremities, that join the curtains, one can only rafe or fire 
along the faces of the opposite baftions, but from any inter-
mediate points between those extremities and the epaule, 
he can fire at or against the said faces. The flanks form 
the principal defences, since an enemy cannot, whilst they 
remain entire, approach the body of the place. And they 
are;
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In his third method of construction he makes his demi-gorges, as in the second, of the same length as in the first, and his flanks of the same length as in the second; but instead of limiting the flanked angle or angle of the bastion to a right one, by supposing a semicircle to be described on a right line, joining the two epaules, he supposes it to remain always acute, by making the capital AG equal to the gorge-line PL.

The calculation of the principal lines and angles in this construction is easily made.

In his fourth method he has no second flanks, but makes all the defences rafant. He considers this method as more general than the three foregoing ones, which it certainly is, since it does not limit the lengths either of the demi-gorges or of the flanks, which, in this as well as in the others, are always on right lines, drawn from the centre of the polygon, through the extremities of the demi-gorges. And although the demi-gorges become greater with the number of the sides of the polygon, they increase so slowly, that in one of 60 sides the demi-gorge is only equal to about 37° 42'. The following is his construction for this method.

From the centre O of the polygon or figure, draw a right line perpendicular to the inward or interior side AB. Divide this perpendicular into such a number of parts, as exceeds the number of the sides of the figure or polygon by unity. Set off two of these parts from each extremity of the inward or interior side, which is always supposed to be equal to 120 toises for each demi-gorge, and take three of them from the said extremities on the little radii produced for the capital of each bastion. Then, from the outer extremities G, H, of these capitals, which are the points of the bastions, draw right lines to the points M, L, where right lines, drawn from the centre through the extremities M, L, of the demi-gorges, intersect the interior side. And these rafant lines, so drawn, will determine both the faces G, I, H, K, and the flanks L, M, K.

By this construction, which is very simple and easy, the flanked angle or angle of the bastion begins to become obtuse in the enneagon, where it is equal to about 98° 6', and grows more and more so in the higher polygons. This angle, however, increases but slowly, or at the rate of about one degree in each successive polygon, amounting in the decagon to about 106° 26'.

The calculation of the principal lines and angles, in this construction, is easily made in the following manner.

The perpendicular, from the centre O of the polygon to the inward or interior side AB, is found by this analysis. As radius:

1. Is to the tangent of the angle OAB = 60°,
2. So is half the interior side AB, or 60 toises.
3. To the perpendicular from O to AB, which is equal to about 104 toises. Wherefore the gorge AL being, by this construction, equal to two-sevenths of this perpendicular, is equal to about 29 3/7 toises; and the capital AG, being equal to three-sevenths of it, is equal to about 44 4/7 toises. The lengthened curtain AM is consequently equal to about 90 toises. Wherefore the angle diminuid AMG, or 1ML, is easily found from the oblique-angled triangle AMG, by this analysis.

As the sum of the sides AM, AG, which is equal to 134 3/7 toises,

4. Is to their difference, which is equal to 45 5/7 toises,
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So is the tangent of half the angle OAM, or 50°.
To the tangent of half the difference of the angles AMG, AGM, which is equal to about 11° 6'. Consequentlie the angle AGM, or half the flanked angle, is equal to about 41° 6', and the angle diminuèd LMI to about 18° 54'. Wherefore the flanked angle, or flankant angle of the baflion, is equal to about 82° 12', to which adding the angle of the centre, or 60°, we get the flankant angle G & H, equal to about 142° 12'.
The angle ILM, in this construction, is obtained by means of the following analogy.

As the sum of the perpendicular from O to A B and half L M, or 134° toises,
Is to their difference, which is equal to 745 toises, or as
405 to 224,
So is the tangent of 45°, which is equal to radius,
To the tangent of 23° 42', which added to 45°, gives
73° 42' for the angle OLM, and consequently 106° 18' for the angle A LO, or its equal ILM, the angle of the flank; to which if the angle diminuèd L MI = 18° 54' be added; we get the angle G I L of the caponier, equal to 125° 18'. And if from the angle OLM there be taken the angle A O B, or half the angle of the hexagon, we get 15° 42' for the flank-forming angle A O L.
The flank IL is found from the triangle ILM by this analogy.

As the sine of the angle I LM, which is equal to about
54° 48',
Is to the sine of the angle diminuèd I ML, which is equal to about 18° 54',
So is the curtain L M, which is equal to about 60° toises,
To the flank I L, which is equal to about 24 toises.
And the perpendicular distance of the interference i of the lines of defence, from the exterior side G H, is found by this analogy.

As radius
So is the half of the exterior side G H, which is equal to about 85.25 toises.

To the perpendicular distance of i from G H, which is equal to about 28.165 or 28.16 toises nearly, exceeding the flank by 4.16 toises.

Mr. Mullen, in his "Elements of Fortification," has delivered what he is pleased to call a new construction. It differs, however, from Mr. Vauban's first method only in the following particulars.

1st. Instead of supposing, like Vauban, each flank to be the chord of an arc described from the shoulder or epaule of the opposite baflion as centre, he supposes it to be the chord of an arc described from the interference of the line of defence and countercarp produced.

2dly. He makes his retired flanks rectilinear, instead of making them in circular arcs.

3dly. Instead of using Vauban's tenailles before the flanks, he places ramparts before them.

4thly. He makes his orillon 5 toises long only, instead of 6, like Mr. Vauban.

Lately, instead of drawing the right line, which terminates the retired flank from the flankant angle of the opposite baflion, like Mr. Vauban, he draws it from a point on the face 5, or rather 10, toises within the said angle.

For, in his construction of this method, he begins, like Vauban, in his first method outwards, and constructs inwards. Like him he also supposes the exterior side of the polygon to be equal to 180 toises; and after observing that the perpendicular may be of any length, as the 6th, 5th, or 4th part of that side, he, like him, also fixes on 39 toises for its length. Like him also he marks the face of his baflion equal to 50 toises, or 12° of the exterior side.

He determines the flankant angle of his ravelin in this manner: he sets off on the face of his baflion from 12 to 15 toises from the shoulder or epaule, and from the opposite angle of the baflion as centre, with the distance therefrom on the line of defence to the extremity of the line, set off from the shoulder on the face of the baflion, he interferes the perpendicular to the exterior side, produced beyond it outwards.

He also gives the construction of a place with detached baflions from an inward or interior side of 1.6 toises, applied to an octagon, in which he substitutes small baflions instead of Vauban's tower-baflions. In this method, he makes the demi-gorges of his small baflions each equal to 12 toises, the capitals of his detached baflions each equal to 55 toises, and their faces each to 60 toises. He determines the flankant angle of his ravelin, by describing from the extremity of the flank, as centre, through a point in the face of the opposite baflion, about 20 toises from the shoulder, an arc to intersect the right line, in which is the capital of the ravelin.

He likewise gives the construction of a place with detached orillon-baflions, beginning outwards, and constructing inwards from an exterior side of 200 toises, and applying it also to an octagon.

He makes his perpendicular, in this construction, equal to 40, or a fifth part of the exterior; the faces of his baflions equal each to 55 toises; the radius of the arc, that serves to determine the position of his flank, equal to 22 toises; the width of the ditch of the flankant angles equal to 16 toises; his orillon equal to 5 toises; and he keeps his flank retired 5 toises.

The marquis de Montalembert has published a large treatise on fortification, in which he makes much use ofcalculate and arches so much condemned by the Chevalier de Ville. His construction is in fact the same with Mr. Blondel's, applied to a right line or polygon, of an indefinite number of sides. For in this extreme case, which is of all others the most defective, Mr. Blondel's construction leaves no curtain, but gives the perpendicular equal to half the exterior side, and the angle diminuèd equal to 45°.

In defending, however, from the right line or polygon of an indefinite number of sides, Mr. Blondel's construction affords a curtain, which gradually increases as the number of the sides of the polygon decreases, whilst the angle diminuèd at the same time gradually decreases, which in a hexagon, by his rule for determining it, viz. by taking from 45°, a third part of the angle of the centre of the polygon, is equal to 25°. But the marquis de Montalembert makes his angle diminuèd in every polygon, and on all occasions, invariably equal, to 45°. His construction is formed by the placing of triangles contiguous to one another, or by the juxtaposition of the angles at the bases of triangles in such a manner, as to make the other sides form re-entering angles equal each to a right angle, from which circumstance it is called la fortification perpendiculaire. It therefore affords no curtains or baflions, but when the elevation is of only an ordinary height, it necessarily creates dead parts from the re-entering angles quite to the flankant ones, or throughout its whole extent.

It may indeed be alleged, that these dead parts can be removed by calculating the retrovolved, countercarps, caponiers, &c. &c. and no doubt they may. But what good reason can be assigned for adopting a mode of construction, which creates every where those very defects, which in constructing the body of any place, it has hitherto been the first object and principal business of every fortifier to avoid, and then
then having recourse to a number of expensive, and otherwise unnecessary, contrivances, merely to get rid of the defects thus created.

As we understand that this system of fortification has been much disapproved of by some of the ablest engineers, on the Continent of Europe; and as the late duke of Richmond, when master-general of the ordnance, was so partial to it that it was with much difficulty and after a great deal of discussion, that the engineers in the Portsmouth division, could persuade him to adopt Vauban's first method in preference to it, for the new pentagonal fort, that has been erected on Portsea island, near Lancing town; a candid and impartial comparison between these two methods of construction may not be useless to professional men, or unacceptable to the public. But we cannot make a comparison between them, more ably, correctly, and scientifically, than it is drawn in an anonymous publication of 1794, re-published in 1825, in the following words.

"It is manifest then, that after a work is once adapted to the ground it is to occupy. &c. the first consideration is to construct it in such a manner, as to leave no dead parts; that is, to leave no such parts as cannot be seen, fired on, or flanked from other parts. That this is a fundamental maxim, and ought to be a primary object of attention in the construction of every work, is manifest from this circumstance: that, were it not with a view to obtain flanking defences for the different parts, a rampart and parapet might as well be raised along the exterior sides of figures themselves, or the curves circumfering them, as along the several parts of the two figures, into which the sides are usually broken for this purpose. The strength of a work, indeed, depends chiefly on its flanks; since an enemy cannot approach the body of the work, whilst the flanking defences remain entire. But if there be dead parts, the moment an enemy gets to them, he finds himself in a state of security, and out of the reach of the besieged's fire. An idea therefore of the necessity of avoiding them has always made such a forcible impression on the minds of able fortifiers, as to induce them to limit the heights of sections. For even when the side of a polygon is 180 toises long, and is broken into two demi-baillons, and a curtain with flanks, if the section of the work be very high, the guns in these flanks cannot fire or suffer the ditch but at too great a distance. When it is only of an ordinary height, it is well known that the guns in the flanks do not see the ditch effectually nearer than the intersecion of the lines of defence, which in Vauban's construction is 44.8683 toises, or 45 toises nearly from the shoulders of the bastions, and 40.2653, or 40 toises and a quarter nearly from the re-entering angles formed by the curtain and flanks. When the exterior side, therefore, is less than 180 toises, the section ought to be kept proportionally lower, provided only it be not so low as to expose the body of the place to surprise. But if it once be admitted as a maxim, that a fortification ought to be constructed without the least regard to any flanking defence, and that the avoiding of dead or uneven parts is an object not worthy of attention; it is evident that the rectilinear and curvilinear are greatly preferable to the zig-zag or triangular construction formed by constructing triangles on the sides of any right-lined figure or polygon. The fire from a straight line is the best of the direct kind that can be obtained, being equally and uniformly distributed. And the enemy cannot advance against it directly, without a good deal of demy, inconvenience, and trouble, but must carry on his approaches somewhat in the way commonly practised, till he gets to the dead parts in front of it: when, unless contrivances be made of that have no natural or inseparable connexion with the construction itself, it will cease to be formidable for want of flanking defences. This observation likewise holds good in a great measure with regard to regular curves, from which the fire is also regularly distributed. The interior area too in each of these defences, and within the same encirclement, length of encloiture, or extent of rampart, is much greater than in the triangular construction, which naturally, instead of producing any fire that is direct or at right angles to the exterior sides, produces no good flanking one for itself, but causes a continuity of dead parts, when the section is high and the lines of defence but short, to reign throughout its whole extent. An enemy can approach it without annoyance from the besieged in lines bifacing either the faifant or re-entering angles, or in short in lines directed to any intermediate points whatever between these angles.

It must therefore be allowed, that the triangular construction, whether the re-entering angles be right ones (as in the "Fortification perpendicular" of the marquis de Montalembert), or acute or obtuse ones, is naturally the most defencable and ill contrived of any that can possibly be thought of or conceived: for it creates dead-part throughout the whole extent almost of the work, and is equally defective of flanking fires for itself, and of a good or well distributed direct one against the enemy.

The marquis, fig. 4, planche 15, vol. i. of his performance, gives what he calls his regular construction in a dodecagon, of which the exterior side is 180 toises. The radius of the circumserbing circle is of course equal to 347.733297; or 347.7335 or 348 toises nearly, and the perpendicular distance from its centre to the exterior side 335.4883457; or 335.4845, or 326 toises nearly. Consequently the annular area occupied by his construction is equal to that of the incribed circle, in the circumstance of which his re-entering angles are of 90°, or which comes to the same thing, to half the area of the circle circumserbing the dodecagon. But if Vauban's construction be made on the sides of the same figure, the annular area occupied by it will be to that of the incribed circle, to which the curtains are tangents at the points, where the perpendiculars produced meet them, as 34950.228 to 85538.24, or as 17520 to 42909 nearly, or in small numbers as 20 to 40 nearly.

The exterior area between the construction and the sides of the dodecagon in Montalembert's method is to that in Vauban's as 8100 to 4270.2657, or in small numbers, as 19 to 1 nearly 1 and as both the faifant and re-entering angles in the former are less than in the latter, this difference of loft area will be considerably increased in practice. For in the marquis's construction, each of the faifant angles contains 60 degrees, and each of the faifant ones 90°; whereas in Vauban's the faifant angle of each baflion is 115° 7' 48", and each of the re-entering ones formed by the flanks and curtain is 95° 15' 3".

Montalembert's construction gives the enceinte or boundary of the body of the place equal to 3054.70128 toises, exceeding Vauban's, which is equal to 2771.1856, by 283.41708 toises.

When he infers or intercalates triangles having their faifant angles right ones and in straight lines, as in figures 3. 5. 7 and 8, planche 15, after the method pointed out in fig. 1, he loses still more area in proportion to the interior space. And the very circumstance of his having recourse to different centres of construction, even on figures that are regular, is sufficient to create a suspicion, that he did not understand even his own method in its full extent.

Although he must certainly be considered as a very thallow and superficial geomcter, the reason for his not fixing on any polygon under a dodecagon for illustrating his regular construction, is very obvious; for no regular figure of a smaller number

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number of sides, will by it give falient angles of sixty degrees, which is the smallest angular magnitude that engineers have generally reckoned admissible in fortification. I can see no good reason, however, (lays our author) for his abandoning regular polygons, when he has occasion for more triangles than twelve, and by way of interpolation inferring the additional ones to this number between right lines, parallel to the sides of triangles, squares, or rectagles, since a construction on the sides of a regular polygon furnishes much more interior area, with a comparatively but trifling increase of length in the enceinte or enclosure of the body of the place.

The comparison, which he draws, p. 197, (illustrated by fig. 9, plane 15.) between Vauban's method on the sides of a square, of which each is equal to one hundred and eighty toises, and his own on the sides of a dodecagon inscribed in the circle circumfcribing this square, is a very improper and unfair one. In this figure, each of the lines, which he calls his lines of defence, is equal to 45.5874 toises, and must, with a section of an ordinary height, have dead parts in front of it throughout its whole extent. Each of the sides is equal to 65,884.6 toises very nearly, and not to 66 toises one foot, as from his scale he erroneously states it to be. The most candid and impartial mode of comparing these two methods of construction together is to suppose both to be made on the sides, of one and the same figure. The marquis's construction, however, on the sides of a square, neither leaves interior area nor falient angles. For its re-entering angles meet in the centre of the circumfcribing circle. But as in it the lines of defence when equal form angles of 45° with the exterior side, each of the falient angles, which it gives in any polygon, is equal to the excess of the angle of that polygon above 90°; or which comes to the same thing, to the excess of the re-entering angle formed by the lines of defence above the angle at the centre of the figure, since the excess of the angle of any regular polygon above 90° is equal to the excess of 90° above the angle at the centre of the circumfcribing circle subtended by one of its sides. Consequently, when the polygon has an indefinite number of sides, or becomes a straight line, the falient angle is equal to ninety degrees. Thus a square with this construction gives no falient angle at all; a pentagon one of 13°; a hexagon one of 30°; a heptagon one of 38° and four sevenths; an octagon one of 45°; an enneagon one of 50°; a decagon one of 54°; an endecagon one of 57° and three elevenths; a dodecagon one of 60°; a polygon of 18 sides one of 70°; a polygon of 36 sides one of 80°; and so on indefinitely. By this construction on a pentagon, of which the side is equal to 180 toises, the re-entering angles come within 34 toises of the centre of the circumfcribing circle; and within 19, if the exterior side be only equal to a hundred toises. How little interior area then would have been left, had this construction been made of for the new pentagonal work on Fortuna island, called Fort Cumberland, of which one of the exterior sides is equal to 120 fathoms, and each of the other four to a hundred! Even on a hexagon, of which the side is equal to 180 toises, it brings the re-entering angles within 66 toises of the centre of the circumfcribing circle, and gives the annular area occupied by it to the area of the inscribed circle as 2 1/2 to 4 - 2 1/2, or as 6.464 to 1, or in small numbers as thirteen to two nearly. If be even made on parts of one and the same straight line as exterior sides, of which each is equal to 90 toises only, the perpendicular distance between that line and the right line parallel to it through the re-entering angles exceeds that between the parallel right lines, limiting Vauban's construction on parts of one and the same straight line as exterior sides equal each to 180 toises, or two of the others, by 2.2756 toises, and only becomes equal to it, when the exterior side is reduced to 85.2498 toises.

The angle (108°) of a pentagon exceeds 95° by 18°, which is equal to the excess of 95° above (72°) the angle of the centre. But 18° are equal to $90° \times \frac{1}{5}$ or $360° \times \frac{1}{10}$, in like manner the excess of (120°) the angle of a hexagon above $90°$ is equal to $15° + 12° (= 30°)$ the excess of 90° above (60°) the angle of the centre, that is, $360° \times \left(\frac{1}{5} + \frac{1}{6}\right)$. Wherefore we get $360° \times \left(\frac{1}{4.5} + \frac{1}{5.6}\right) \times$, &c. indefinitely or $ad^f substantiatis$ $= 90°$, and of course $\frac{1}{4.5} + \frac{1}{5.6} + \frac{1}{6.7} + \frac{1}{7.8} + \&c. = ad^f infinitum$, and innumerable other forms, may easily be derived from common geometry and the angular relations of rectilinear figures. But the summation of infinite series is a subject which it is not my intention to enter into the consideration of at present.

There is a circumstance attending this construction, which, I dare say, never occurred to the marquis. It is this: though on the sides of a square it brings the re-entering angles to the centre of the circumfcribing circle, and leaves neither interior area nor falient angles; yet, if it be made on the sides of any given regular polygon, and the re-entering angles be joined by right angles forming a similar polygon, and on them a similar construction be made, and so on indefinitely or $ad^f infinitum$, it will never bring the re-entering angles to the centre of the circle circumfcribing the given polygon, but nearer to it than by any given right line or distance. And if spirals be supposed to pass from the angles of the polygon through the angular points of equal angles in endles or indefinite succession (each equal to 45 degrees, together with the same angle of the construction and the complement of its half) formed by the lines of defence taken singly from the first in the indefinitely successive constructions, will pass round the centre of the circle circumfcribing the given polygon, and a definite number of times without ever reaching it; and the area between any two of these spirals commencing from one of the exterior sides of the polygon will become nearer in point of equality than by any given space or area to such a part of the polygon, as is expressed by the number of its sides, without ever equalising it. The sum or aggregate of these lines of defence, in decreasing geometrical progression and endless succession, can always be expressed by a given definite straight line.

From what has been observed, the following inferences may certainly be very fairly and impartially drawn respecting Montalembert's construction. 1st. When the exterior sides are short, it naturally creates, with a section of an ordinary height, dead parts throughout its whole extent. It may perhaps be alleged, that this capital defect can be removed by caismed defences with artillery near the re-entering angles on a level almost with the ditch. To a certain degree it certainly may: but that method of construction, which by itself naturally removes every such defect without any obfolute or adventitious contrivance, is surely entitled to preference in the opinion of every able or intelligent fortifier.
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34thly. His slanting angles are too small, being less in a dodecagon than Vauban's are even in a square; for in a dodecagon his slanting angle is only equal to sixty degrees, whereas in a square Vauban's is equal to 60° 55' 39", and in the dodecagon 113° 7' 48". This is unquestionably an essential defect.

35thly. It furnishes no fire that is direct or perpendicular to the exterior sides. That this is a great defect cannot be denied.

44thly. Opposite to each re-entering angle, at the distance only of 90 toises from the exterior side, there is a quadrangular space (which no fire from the place cou'd command, or touches), commencing in an angle of 90 degrees, and terminating in one of 30 degrees, at the same distance from the exterior side with the centre of the dodecagon.

55thly. Opposite to every slanting angle, and at the distance from it only of about 254 toises and a half, there is a space that is not secured or commanded by the fire of the place, which commences in an angle of 90 degrees, widens till its breadth becomes equal to the radius of the circle circumferencing the dodecagon, and then runs on indefinitely at that width between parallel lines.

66thly. The greatest width of each of the first-mentioned spaces not traversed by the fire of the place is to the corresponding width of each of the spaces traversed by it as 104 to 137, nearly: and the greatest width of each of the last-mentioned spaces not traversed by the fire is to the corresponding width of each of the spaces traversed by it as the radius of the circle circumferencing the dodecagon to 137-76 toises, or as 204 to 100, nearly.

77thly. As the respective breadths of these spaces not covered by the fire of the place bear so great proportions to the corresponding breadths of those covered by it, and, as the distance between every two of them is only equal to one of his lines of defence, or 127,2794 toises, the besiegers may advance almost to the very creft of the glacis without any interruption from the fire of the besieger. But it is an important object in defence to keep the besiegers at a distance from the body of the place as long as possible. For when they once get within the distance of serious musketry from it, they will infalubly silence artillery, whether the embrasures be open or covered at top, or whether the guns be in canister or not.

88thly. The besiegers may easily destroy his principal covered musketry-defences before they are exposed to his principal caffeinated defences with artillery, which being low, to take off the dead parts unavoidably occasioned by the very nature and badness of his construction, are chiefly calculated for defending the passage of the ditch, and cannot annoy an enemy till he gets to the very creft of the glacis, after which every thing almost, except battering in breach, is determined without artillery.

Lastly. The great proportion which the annular area, occupied by his construction, bears to that of the incircled circle, will for ever render it unfit for the purpose of fortifying any considerable town or city.

The marquis de Montalembert's construction has no claim even to originality, if we except the great improbability (I had almost said folly) of making the lines of defence in it form the same angle in all figures, and on all occasions; for when applied to a straight line (as in fig. 1, planche 15, vol. 1) it is the same with Mr. Blondel's. In this case both give the perpendicular equal to half the exterior side, the angle diminished to 45°, the slanting angle or the bastion equal to 50°, the same line of defence, the same flanking or re-entering angle, and no curtain. The only difference between them consists in this, that Mr. Blondel, in defending from the right line or polygon of an indefinite number of sides to inferior polygons, makes his angle diminished gradually according to the rule he has delivered for ascertaining its magnitude, whereas the marquis keeps his in all figures invariably the same. [Mr. Blondel's rule for ascertaining the angle diminished is the following: add fifteen degrees to one-third part of the excess of the angle of the polygon above 90 degrees.] Mr. Blondel's construction on an indefinite right line gives the perpendicular nearly double what it ought to be; and the marquis, by keeping this preposterously large perpendicular in all figures on the same exterior side and his angle diminished invariably, finds the slanting angle of his dodecagon equal only to 60°, the smallift that is generally considered by engineers as admissible in fortification. This circumstance, therefore, by the marquis's own acknowledgment, renders his construction inapplicable to any polygon of a smaller number of sides than twelve, and is certainly sufficient of itself to demonstrate not only its impropriety, but, I believe I may venture to say, even absolute absurdity. It in fact furnishes nothing but star-figures with re-entering angles of 90°; and it is manifest that no regular figure of this sort under a dodecagon will give slanting angles of 60°.

Notwithstanding these observations, which I have certainly made with the strictest attention to truth, and, I flatter myself, also to candour, I am heartily disposed to allow every point of merit to the marquis's voluminous performance, that either his grace or any other person can point out as really belonging to it. I never can be hostile to any person who even endeavours to enlarge the poudria, either of abstract science or professional knowledge; for the very attempt is laudable. And I must confess I am inclined to believe, that some of his caffeinated contrivances might, in certain situations and circumstances, be advantageously united with Vauban's construction. I cannot help considering him however as rather a superficial geometer, and as a very loofe and incorrect writer. But to prevent the possibility of charging me with misrepresentation in regard of his incorrectness, I will briefly quote his own words.

In his "Décours Prélinaire," p. 38, he says, "Le premier système de M. de Coehorn est absoiment le même que celui du Comte de Pagan, auquel il a seulement ajouté une tour cintrée à chaque orillon, pour défendre les faces hautes des bastions." That he should have hazarded such an assertion is to me astonishing. For these two methods differ widely and essentially. In Coehorn's first method, which is applied to a hexagon, for instance, the ratio between the perpendicular and exterior side is very different from what it is in Comte Pagan's: since in the first the angle formed by the exterior side and line of defence is equal to 24° 38' 48", whereas in the last it is only equal to 18° 26' 46°. The difference is 5° 12' 42". The slanting angle of the bastion in a hexagon by Comte Pagan's method is equal to 83° 7' 46", whereas in Coehorn's first method it is only 70° 42' 24", falling short of the other by 13° 25' 24°. These are capital and essential differences. And every person who chooses to examine them will find them very different in many other respects. Vauban indeed appears to have borrowed more from Pagan than Coehorn has done. For, in any polygon having its exterior side equal to 180 toises, their perpendiculars are equal as well as the slanting angles of their bastions; and I am persuaded that even the greatest admirers of Vauban can assign no good reason for his not having followed Comte Pagan also with regard to the position of his flank, and placed them at right angles to the line of defence instead of making them meet in an angle of 80° 46' 57". There is great reason to suppose that the Count would have made the face of his bastion considerably
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fiderably shorter than he did, had he not intended to have three flanks instead of one. He makes it 55 toises. But it is naturally to be presumed, that had he intended to con-

struct with a single flank, he would have bisected the per-

pendicular distance between his orillon and inner flank (which is 20 toises) and drawn his flank at right angles to the line of defence through this point of bisection, thereby forming a more complete construction for the body of the place with single flanks than Vauban has done. And it is somewhat remarkable, that this line nearly coincides with a perpendicular to Vauban's line of defence from its point of interference with the flank. Had he therefore, instead of taking five toises from the face of Count Pagan's bastion, taken ten, and then placed his flank at right angles to the line of defence, he would, without lengthening this line, have given the face of his bastion its proper length, and at the same time made the flank itself about equal to the per-

pendicular, as it ought to be, since perpendiculars to the ex-

terior sides of polygons were first introduced into con-

struction for the sole purpose of obtaining flanking defences.

Were I at present treating formally of fortification, I would deliver a very simple method of construction for rendering the flanks always equal to the perpendiculars to the sides of the polygon.

The lengths however assigned to the perpendiculars are merely arbitrary, and by no means derived from reasoning either on the properties of the figures or their relative degrees of importance and capability of defence. For there appears no reason for giving the same perpendicular to a hexagon and every other polygon of a greater number of sides, as Vauban has done, or to all regular figures above the square, as Count Pagan has done. In like manner Cochon's perpendiculars are too long, and merely arbitrary: for in his first method, which is applied to a hexagon, the angle formed by the exterior side and line of defence is, as I have already observed, equal to 24° 39' 48"; in the second, which is applied to a heptagon, 24 degrees and two sevenths; and in the third, which is applied to an octagon, 25 degrees. This angle in Delabor's first and second methods applied to an octagon is also too great, being in the former equal to 26° 33' 54", and in the latter to 29° 48' 59". In his third method however, which is also applied to an octagon, it is equal to 27° 48' 5" and is not so much distant from what it really ought to be, as it differs only about three minutes from the angle subtended by the true perpendicular of an enneagon.

The perpendiculars are also a great deal too long in Blon-
del's method, which, when it is applied to a straight line or polygon of an indefinite number of sides, gives one equal to half the exterior side.

Le marquis, vol. i. p. 191, says, "Mais d'es que lignes de défense peuvent avoir jusqu'à cent cinquante toises, et les hypotenus environ deux cent dix-huit toises, il fuit que le rayon de ce polygone régulier inscrit dans le cercle peut être de quatre cent vingt-six toises et demi, le rapport du côté du dodecagone à son rayon étant comme quinze à un, est en effet environ, et ce rayon est de peu pres celui d'un polygone à baillons de quinze côtés, par conféquent de quinze baillons.

A right-angled triangle however, having each of the sides containing the right angle equal to 150 toises, does not give the hypotenuse equal to 216 toises, but to 212.132 toises, which, as the side of a dodecagon, gives the radius of the circumcirculating circle equal to 409.876 toises very nearly, and not to 421 as he flites it to be.

In page 203 he falls into the same mistake.—Take how-

ever his own words:—

"Mais l'on a vu, comme il est aisé de le sentir, qu'il est un terme où le rayon d'un cercle ne pourroit plus déter-

miner le côté de notre manière de forteriser : et ce terme est

celui où la corde de l'angle au centre de trois degrés que le rayon donnerait, pafferaient deux cent vingt toises, puisqu'alors cette corde prise pour diagonale aurait deux côtés de plus de cent cinquante toises chacun, qui est une distance plus grande que celle admirable pour la portée des armes à feu de

but en blanc."

Here he mentions 150 toises as the greatest admissible length for each of the lines of defence, and 225 for the cor-

responding hypotenuse, or exterior side, which he calls the

diagonal. But the fact is, that a hypotenuse of 210 toises, gives either side of an icosoids right-angled triangle consti-

tuted on it greater than 155 toises and a half. There are many mistakes of a similar nature in this gentleman's per-

formance, who appears to have used scales much more than calculation. The exposure of error, however, is an unpleasant task, even when the elucidation of truth is the object."

From the whole of what is above delivered, it appears evi-

tent, that the magnitude of the angle diminués, and of the perpendicular to the exterior side, on which the other parts of the construction chiefly depend, is with all the writers on forti-

ication a mere arbitrary assumption, for which they do not even attempt to assign any reason, and much less any good one, drawn from the nature of the polygons themselves, the various degrees of difficulty in embracing them, or their respective degrees of capacity of defence. The truth is this, that every polygon has a perpendicular belonging to it, of a precise and determinable length, or bearing a given ratio to the exterior side. And the ascertaining of the true per-

pendiculars belonging to all different polygons is the great

dideratum now wanted for perfecting military construction.

We understand, that Mr. Glenie, formerly of his majesty's corps of engineers, has had in his possession a complete in-

vestigation of this important problem for upwards of twenty-five years. But as he has not yet chosen to make it known to any person, we could not expect him to communicate it to us. He has, however, been pleased to furnish us with the following rules, which have been made known to several individuals, both for regular and irregular construction, on the latter of which nothing of extensive application or much delivering of notice has as yet been delivered by the writers on forti-

ication.

A short paper on fortification, delivering a method of con-

struction for always making the flanks either equal to the perpendiculars to the exterior sides, or in any given ra-

tio to them, and also a rule alike applicable to regular and irregular construction; and, in its application to the latter of thieves, infinitely more extensive than all that has been hitherto published on the subject. By James Glenie, esq.

A.M., and fellow of the Royal Societies of London and Edinburgh.

"After the invention of gun-powder, the ancient method of securit and fortifying places was gradually departed

from. Various important alterations were introduced into fortification, as the construction and man-

agement of artillery became more and more improved. Many treatises have been written on the subject in different nations and languages. And could we for a moment sup-

pose improvements in the art military to have kept pace with these publications, we must naturally conclude, that military construction has by this time reached almost all the perfection it is capable of. But although war has been a profession in Europe, and the attack and defence of places has been studied as a science for almost the two centuries past, it is a certain and undeniable fact, that no writer on forti-

fication has as yet either discovered or demonstrated the true lengths of those lines, on which the other parts of the con-

struction of a work chiefly depend; viz. the perpendi-

culars.
culars to the sides of a polygon, from which the body of the place is to be contructed. No writers on this subject have allligned any sufficient, good, or even plausible reasons for the lengths they give to these lines. With them all, without an single exception, the perpenculars to the exterior sides of a work are mere arbitrary assumptions, and not the result either of any scientific or professional investiga-
tion. Even Mr. Muller, in the three new confructions which he gives in his "Elements of Fortification," in imitation of others, affumes those lines in a manner altogether arbitrary, without allligning any reason whatsoever for such assumptions. In page 76 of his said elements, in his problem for determining the several parts of a front of a fortification," he makes use of the following words: "But as to the length of the perpencular CD, it is no ways determined; for some engineers make it twice as long as others; they seem indeed to derive from one another merely out of contradiction; since none of them, that I know of, has given any reason for this practice." This observation sufficiently shews, in what an imperfect state military confruction remains even at present. For the true lengths of the perpenculars form the great deliberatum in it, fixed on them the flanking defences chiefly depend, for the sole purpose of obtaining and preventing dead parts, the sides of a polygon are broken, either of them into a curtain with two demi-battlions to form the respective fronts of the work. And it must be allowed, that when a work is once adapted to the ground, it is intended to occy, and its position is fixed on, the first consideration after determining the true lengths of the perpenculars to the exterior sides, is to contruct the whole of it in such a manner, as to have no dead parts; that is, to leave no such parts, as cannot be seen, fired on, or flanked from other parts. That this is a leading or fundamental maxim, and ought to be a primary object of attention in the construction of every work, is manifest from this circumstances, that were it not with a view to obtain flanking defences for the different parts, a rampart and parapet might as well be erected on the exterior sides themselves of a fortification as on the figures, into which they are usually broken for that purpose. The strength of a work, indeed, it must be confessed, depends chiefly on its flanks, since an enemy cannot approach the body of the place, whilst the flanking defences remain cut off. But if there be any dead parts through a deficiency of such defences, the moment an enemy gets to them, he finds himself in a state of security, and out of the reach of the beleaguered's fire. The absolute necessity of avoiding them, has always made such a forcible impression on the minds of able fortifiers, as to make them limit the height of fections. For even when the side of a polygon is not more than 180 toises, or 360 yards long, and is broken into a curtain with two demi-battlions, if the section of the work is very high, the guns in the flanks cannot see or fire the ditch but at too great a distance; and it is well known, that when it is only of an ordinary height, they cannot see or command it effectually, nearer than the interfection of the lines of defence. But were it even to be alleged, which would however be an allegation altogether inadmissible, that a fortification ought to be contructed without the least regard to any flanking defences, and that the avoiding of dead or unfeen parts is an object unworthy of attention, it is evident that the rechilinster is preferable to the zig-zag or angular confruction formed by the placing of triangles contiguous to one another, or by the juxta-position of angles at the bases of triangles. For the fire from a slant line is the best of the direct kind that can be obtained, being equally and uniformly distributed. And the enemy cannot advance against it directly, without a good deal of delay, inconvenience, and trouble, but must carry on his approaches from behind the way commonly practised, till he gets to the dead parts in line of it, when it will cease to be formidable for want of flanking defences. The angular or zig-zag line, on the other hand, has no good direct fire, and indeed no flanking fire whatever, where it is most wanted, or can be of any utility; but a continuity of dead parts, when the section is of a sufficient height, reigns throughout its whole extent. An enemy can approach it without being exposed to any direct fire from the beleaguered, that can annoy him, in the lines bisecting either the flankant or re-entering angles, or, in short, in lines directed to any other intermediate points whatsoever, between these angles.

And it is no les evident, that the direct fire from the circumference of a circle, or from any other curve, that returns into itself, is much more equal and uniform, and better distributed than that from an angular or zig-zag line.

That able general and forther, the celebrated marshal Vauban, whole systen has been followed in Europe, in contructing from the sides of a square, made the perpencular an eighth part of one of them, in a pentagon a seventh part, and in a hexagon, and all polygons of a greater number of sides, a sixth part. For this practice, however, he has not assigned any reasons. It is impossible indeed to assign any good reason for giving to a polygon of twenty or thirty sides, or to a contruction on part of a right line, which may be regarded as a polygon of an indefinite or infinite number of sides, and to a hexagon, or a figure of only six sides, the same length of perpencular. Any per-
son, without even a knowledge of geometry, to enable him to draw deductions from the properties of figures themselves, who reflects but a little on the subject, mult natura-
clude, that there can be no found or good reason for doing fo. The truth, in fact, is this, that every polygon has a precise and determinate perpencular of its own, proportional to and connected with its capability of being defended, and of being embraced by a beleaguered enemy, as, says Mr. Glicne, I shall clearly demonstrate in a subfequent paper, that may ere long be presented to the society, as we have shewn, how an inordinate number of infinite series may not only be derived from, but also summed geometrically by means of polygons: and I make no doubt, that had Vauban posseffed a sufficient knowl-
edge of mathematics for the purpose of applying them to the improvement of the theoretical part of his professon, he would have discovered the precise or genuine lengths of perpenculars, which different polygons ought to have, and would have regulated his practice accordingly, in the numerous works he contructed. Unwilling to give into prolixity, I will not, at present, enumerate the different lengths of perpenculars to the sides of one and the same figure or polygon, which the various writers on fortification have affirmed, although the enumeration would prove beyond controversy, that in affurcing them they were guided by their own whims and fancies, and not by any just or determinate rule. It mult however be regarded as a singular fact, that though perpenculars to the sides of polygons were first introduced into construction, for the sole purpose of obtaining flanking defences, not one of these writers, in even treating formally of regular fortification, has either offered, or attempted to deliver, a method of contruction for rendering the flanks always equal to the perpenculars as they ought to be. To supply this defect I will now proceed to give such a contruction, which, like many other things in science, most pregnant with utility, and most extensive in their confructions, has probably been hitherto overlooked chiefly on account of its simplicity.
**Construction.**

Let \(AB\) (fig. 17.) be a side of any given polygon, either regular or irregular. Let it be bisected in the point \(C\), and let \(CV\) be an indefinite perpendicular to \(AB\) at the point \(C\). Through the point \(O\) let indefinite right lines \(AS, BT\), be drawn from the points \(A, B\), and let \(CD, CE\), be each equal to one-half of \(AO\) or \(BO\). Draw the right lines \(DF, EG\), parallel to \(CV\) till they meet \(AS, BT\), in the points \(F, G\); and from the said points \(F, G\), draw \(FK, GL\), perpendicular respectively to \(BT, AS\). Then I say that \(FK, GL\), are each equal to \(CO\).

**Demonstration.**

Since by construction \(AD\) is equal to \(BE\), and \(AC\) to \(BC\), and \(CO\) is perpendicular to \(AB\), the angle \(CAO\), or \(DAF\), is equal to the angle \(CBG\) or \(EBG\), and \(DF\) is equal to \(EG\), being parallel thereto. Wherefore \(FG\) is parallel to \(AB\), and equal to \(DE\), which is equal to \(AO\) or \(BO\). Consequently, since \(FK\) is perpendicular to \(BT\), and \(GL\) to \(AS\), by construction, the triangles \(ACO\), \(FKB\), \(FLG\), are equiangular and equal, and \(CO\), \(FK\), \(GL\) are equal. Q. E. D.

Thus then the flanks \(GL\), \(FK\), drawn at right angles to the lines of defence \(AL, BK\), or \(AS, BT\), are by this very simple construction always equal each of them to the perpendicular \(CO\), whether \(AB\) be the side of a regular or an irregular polygon.

The perpendicular distances \(FL, GK\), of the flanks \(GL, FK\), from the shoulders \(F, G\), of the demi-baftions \(AFK, BGL\), are each of them equal to half the exterior side \(AB\). And each of these perpendicular distances \(FL, GK\), is to the curtain \(KL\), as the sine of the angle formed by either flank, and said curtain, to the sine of the angle at the shoulder of either demi-baftion, that is, as the cofine of the angle formed by the exterior side, and either line of defence, to the cofine of twice this angle.

From the similarity of the triangles \(ACO, ADF, BCO\), \(BEG\), we have each of the faces \(AF, BG\), of the demi-baftions equal to \(\frac{AO \times AD}{AC}\) or \(\frac{AO \times AC - 2}{AC}\), or to \(\frac{AO \times 2AC - AO}{2AC}\). Now if \(AB\), or \(AC\), be denoted by \(2P\) and \(AO - AC\) by \(2Q\), each of these faces will be exprest by \(\frac{P + 2Q}{2} \times \frac{P - 2Q}{2}Q\), or \(\frac{P - 2Q^2}{2P}\), which, when the perpendicular \(CO\) is but small, is nearly equal to the half of \(AC\), or to a fourth part of the exterior side \(AB\).

Each of the angles \(AFK, BGL\), of the shoulders of the demi-baftions is equal to a right angle, together with the angles \(BAO, ABO\), formed by the exterior side \(AB\), and the lines of defence.

**Scholium.**

In like manner may a construction be delivered, which will make each of the flanks \(FK, GL\), have any given ratio \(m : n\) whatever to the perpendicular \(CO\). For if \(CD\) or \(CE\) be taken to \(\frac{m}{2}\) as \(n : m\), we shall have \(DE\) equal to \(\frac{AO \times m}{n}\), or \(n : m :: AO : DE\) \((FG) :: CO : GL\) or \(FH\). And if \(AC\) be denoted as above by \(P\) and \(AO\) by \(P + 2Q\), each of the faces \(AF, BG\), of the demi-baftions, will, in this case, be equal to \(\frac{2n - m}{n} \times P + \frac{n - m}{n} \times 2Q - \frac{m \times 2Q^2}{n} - \frac{n}{P^2}\).

Mr. Muller, in the preface to his "Elements of Fortification," expresses himself in the following words:

"Notwithstanding the art. - others."

"For the true art confineth in - weakness."

Mr. Muller certainly treats of irregular fortification in a more direct and particular manner than any other author that wrote on the subject before him. But his constructions on the sides of an irregular polygon are similar to that which he makes use of on the sides of a regular one. His perpendiculars in both are mere arbitrary assumptions, and the flanks, as well as the faces, of his demi-baftions in each front of both are equal. The rules therefore delivered by him, as well as by the other writers on fortification, may justly be regarded as only applicable to regular construction. For although they treat of irregular fortification, they suppose the perpendiculars to bisect the external sides, the lines of defence, drawn from the extremities of any one of these sides, to equal or in right lines with it, and the correspondent parts, such as the faces and flanks let fall from the face, to be equal, alike, and similar. They do not so much as even contemplate or once speak of any case, wherein the lines of defence make different angles with the exterior side, or wherein either the flanks or faces of the same front are of different lengths, or unequal to each other. It frequently happens, however, that an engineer cannot prefer this equality between either the faces or the flanks let off from the same exterior side, without losing the principal advantages arising from the nature and situation of the ground, and deviating from what ought to be the leading maxim in the construction of every work, namely, the proportioning of the fire of each part, as nearly as possible, to that which the enemy can bring against it; or, in other words, the defence in every place to the attack. To remove this difficulty and inconvenience, and to enable engineers to practise with facility and expedition the whole possible variety of irregular construction, I will proceed to deliver a rule, which I have had in my possession for nearly twenty-two years, but have not till now thought proper to communicate to the public. Its simplicity has, I suppose, been the principal cause of its being so long unnoticed or unattended to. It is easily and expeditiously carried into practice. It is applicable to regular and irregular construction, and in its application to the latter is infinitely more extensive than all, that has hitherto been published on the subject.

This rule is derived from the following very simple geometrical proposition.

If from the extremities of any given right line, two right lines be drawn in any angles, either equal or unequal, and from any two points in these lines, two other right lines be drawn reciprocally meeting them, produced beyond their intersection in any given angle, the angles formed thereby at these points, will be equal between themselves, and each of them equal to the two first mentioned angles, together with the given angle.

**Demonstration.**

Let \(AB\) (fig. 18.) be the given right line, from the extremities \(A\) and \(B\), of which right lines \(AF, BE\) are drawn, making any angles \(FAB, EBA\), therewith whatever, either equal or unequal; and from any two points, \(C\) and \(D\), in these lines, let other right lines \(CE, CD\) reciprocally meeting them, produced beyond their intersection \(I\) in angles \(CIE, DFI\), each equal to the given angle. I say that the angles \(\triangle YAE\)
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ACE, BDF, formed thereby, are equal, and that each of them is equal to the angle CEI or DFI, together with the angles FAB and EBA.

For (by 32 E. 1.) the angle ACE is equal to the angle CEI, together with the angle CIE: and by the same proposition, the angle CIE is equal to the angle FAB, together with the angle IBA. Therefore ACE is equal to CEI or DFI, together with FAB and EBA.

In like manner, BDF is equal to DFI or CEI, together with FAB and EBA, and consequently is equal to ACE, Q. E. D.

From the foregoing very simple proposition is derived the following rule.

Whether the angles, which the lines of defence drawn from the extremities of any exterior side make therewith, be equal or unequal, and the angle made by another flank with its line of defence be equal, or greater, or less than a right angle; in every case, the angle of either shoulder is equal to these three angles taken together; that is, to the angle formed by either flank with its line of defence, together with the two angles formed by the lines of defence with the exterior side.

By means of this rule, an engineer may trace out any work, however irregular, in an tenth part of the time requisite for tracing out even a regular work of the same size and dimensions, by the methods of construction hitherto prescribed and made use of. He is under no necessity of finding the centre, or of erecting perpendiculars to the exterior sides, which, in irregular construction, cannot be fixed and ascertained without calculation, trouble, and inconvenience; but after determining in his own mind on the angles, which the lines of defence are to make with the exterior sides, and laying them down, fixes the positions of the flanks, and lets them off from the shoulders, almost as expeditiously as he can walk over the ground. He may use it in woody places, with nearly as much ease and facility as in those that are clear and open; and in every situation, in short, where he can see to the distance of a few yards on each side of him. By it he can trace out in the field, and even in the face of an enemy, with almost mathematical exactness and accuracy, and much more expeditiously than by the tentative and inaccurate random-methods commonly made use of, and without the aid of a theodolite, plain table, or other bulky or cumbersome mathematical instrument: for a pocket Hadley's sextant, which will be useful on most occasions, is all that is necessary in any situation.

It may not perhaps be improper to mention the circumstance that first led me to think of this rule, and gave rise to the putting of it in practice. In summer, 1783, Colonel Moncrieff, Lieutenant Fiddles of the Engineer corps, and myself, went one afternoon to trace out a large pentagonal work, near Stoke's Bay House and Gomer Pond in the Gosport division, on one of the fronts of which it was thought advisable, from the nature of the ground, to have the flanks of different lengths, and thereby to vary the directions of their fire, and those of the faces of the embalmments, from those which the ordinary method of construction would have given. Colonel Moncrieff, who, though he was commonly and justly reckoned a good judge of ground and positions, was, from the inapplicability of the customary rules to such a case, totally at a loss for the construction. He had Muller's "Elements of Fortification" in his hands, but could derive no aid or assistance from them. His embarrassment, and the novelty of our situation, which none of us had thought of beforehand, let me a

thinking seriously how we might surmount the difficulty. After a few minutes reflection, I discovered the following rule, which I immediately applied on the spot, and very expeditiously. I might, however, as well as others, have overlooked it even to this moment, had it not been for the incident now mentioned. For the simplest and most useful things are generally least attended to. I gave copies of it in writing to these two gentlemen at their request, and another to his grace of Richmond.

There are various maxims delivered by the writers on fortification, which relate to the construction and defences of the works, independent of the general considerations for or against the erection of the fortifications themselves, in different circumstances and situations. A number of these maxims, however, are very questionable, and, on due examination, would be found to be inadmissible, having been laid down by men who did not understand the true principles of construction.

The following may, perhaps, be justly regarded as the most unexceptionable of the maxims that are commonly delivered.

1. There ought to be no part in the whole circuit, or extent, of a fortres or fortification that cannot be seen, flanked, or defended from some other part. That this is not only an admissible but a fundamental maxim, and ought to be a primary object of attention in the construction of every work, is manifest from this circumstance: that, were it not with a view to obtain flanking defences for the different parts, a rampart and parapet might as well be erected on the right lines themselves, which form the exterior sides of polygons, as on the figures, into which they are usually broken for this purpose. The strength of a work indeed depends chiefly on its flanks, since an enemy cannot approach the body of the place while the flanking defences remain entire. But if there be dead or unseen parts, the moment an enemy gets to them he finds himself in a state of security, and out of the reach of the besieged's fire.

An idea, therefore, of the absolute necessity of avoiding them, has always made such a forcible impression on the minds of able fortifiers, as to induce them to limit the height of sections. For even when the side of a polygon is equal to 180 toises, or to 360 yards, and is broken into two demi-bastions and a curtain with flanks, if the section of the work be very high, the guns in those flanks cannot fire or scour the ditch, but at too great a distance. When it is only an ordinary height, it is well known, that the guns in the flanks do not fire the ditch effectually nearer than the intersection of the lines of defence, the distance of which, in Vauban's construction, from the epaulies or shoulders, is equal to 45 toises nearly. Mr. Blondel's construction, therefore, in polygons of a great number of sides, and that of the marquis de Montalembert, which is nothing but Mr. Blondel's on a straight line or a polygon of an infinite or indefinite number of sides, are in this respect radically defective, creating dead or unseen parts throughout their whole extent, which cannot be removed but by calculating and contrivances, that have no natural connexion whatsoever with the constructions themselves.

2. The defence of every part ought to be always within the certain reach of musket-shot, in order to be defended both by great and small fire-arms: for if any parts be at too great a distance from those that flank them, to be within the reach of a serious and efficient fire of musketry, or can be defended by cannon only, the enemy may dismount these cannon by the superiority of his, and thereby destroy the defences of such parts at once. But if they be defended by
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by both cannon and musketry, should one of these two species of defence be destroyed, the other will still remain.

It has been frequently alleged, that a musket-shot will not kill at a greater distance than 150 toises, or 300 yards, or 900 feet. If this be true, the great line of defence, or the distance from the flanked angle or salian angle of the bastion to the opposite flank, ought not to exceed 150 toises, or even to be equal to fo many toises. If, on the other hand, the line of defence were to be about two-thirds of that length only, or equal to about 100 toises, the bastions would be too near to one another, and too small, which would both increase their number in the same circuit or enceinte, and lessen their strength or capability of defence.

The length of the great line of defence, in order to render the fire more certain and efficient, is therefore commonly supposed to be equal to from 130 to 140 toises only.

3. All the defences should be as nearly direct as possible: for soldiers naturally fire directly before them. The lines of defence, therefore, should be either like Count Pagan’s, perpendicular to the flanks, or nearly so.

4. A fortification ought to be equally strong on all sides: for if he not, an enemy may attack it on the weak side, and avail himself of its inequality of strength.

To these maxims we will take the liberty to add a few others, that are not to be found in the writers on fortification, but which we, nevertheless, conceive to be entitled to the most serious consideration. They are the following, and we are favoured with them by Mr. Glenie.

1. In regular construction, the two flanks in each front ought to be equal each of them to the perpendicular to the exterior side of the polygon, or nearly so, since perpendiculars to the exterior sides of polygons were introduced into construction for the express purpose of obtaining flanking defences. And in regular construction, when it is necessary (as it generally is, in order to make field-works suit the ground they occupy) to make the two flanks in the same front unequal, their sum or lengths taken together should be equal to twice the perpendicular distance from the intersection of the lines of defence to the exterior side, or nearly so.

Mr. Glenie, in the foregoing paper, has given a very easy method of making the flanks in regular construction, either equal to the perpendiculars, or in given ratios to them.

2. The face of the bastion, in regular construction, ought never to exceed one-fourth part, or two-eighths of the exterior side. The construction, which gives each of the flanks in the same front equal to the perpendicular, makes the face of the bastion equal to a fourth part of the exterior side very nearly.

3. The flanked angle, or salian angle of the bastion, ought never to be less than an angle of about 71°, and should never exceed 120°. In Count Pagan’s method, however, and that of Mr. Vauban, who has followed him, this angle in a polygon of only 18 sides is equal to about 13° 47° 45°; in one of 30 sides, to 131° 7° 45°; and in a construction on a right line, or part of a polygon of an infinite or indefinite number of sides, to 143° 7° 45°.

4. The angle of the escarp or shoulder should not be less than an angle of about 108°, and ought never to exceed an angle of 150°.

5. The flanks of the flank ought not to be less than an angle of about 110°, nor greater than one of about 120°.

6. The outward flanking angle, or the angle formed by the lines of defence at their intersection, ought not to be less than 120°, nor ever greater than 160°.

Lastly. Different polygons have different perpendiculars, which have respectively given ratios to the sides of the polygons. And the perpendicular that truly belongs to any polygon of a given number of sides, is different from that which belongs to any other polygon of a different number of sides; the exterior side in each of the polygons being supposed invariable or the same. A construction on the sides of any polygon of a given number of sides, ought to be made with the perpendicular that peculiarly belongs to it. An investigation, however, of the various perpendiculars that respectively belong to various polygons, from the square up to the right line, which may be regarded as part of a polygon of an indefinite or infinite number of sides, has never as yet been delivered by any writer on fortification; and it now forms the great deliverum in military construction.

CONSTRUCTIVE TREASON, in Law, was defined by 25 Edw. III. cap. 2. See TREASON.

CONSAULES LUDI, among the Romans, the same with Circenses ludii. See also CIRCUS.

CONSULTA, in Antiquity, feasts which were held among the ancients, in honour of the god Confus, i.e. Neptune; different from those other feasts of the same deity called Neptunalia.

They were introduced with a magnificent cavalcade, or procession on horseback; because Neptune was reputed to have first taught men the use of horses: whence his surname of THORUS, Equesiris.

Evander is said to have first instituted this feast: it was re-established by Romulus, under the name of Confus; because it was some god under the denomination of Confus, that suggested to him the rape of the Sabines. It is said, that it was with a view to this rape, that he formed this institution. This, however, is certain that it was to this feast all his neighbours were invited; when, taking advantage of the solemnities and sacrifices, he seized the women. To draw the greater concourse of people, he gave out that he had found an altar hid under ground, which he intended to consecrate, with sacrifices to the god to whom it had been originally erected.

Thofe who take upon them to explain the mysteries of the heathen theology, say, that the altar hid under ground, is a symbol of the secret design of Romulus to seize his neighbours’ wives.

The consualia were of the number of feasts called sacred; as being consecrated to a divinity. Originally they were not distinguished from those of the Circus: whence it is, that Valerius Maximus says, that the rape of the Sabines was effected at the games of the Circus.

Plutarch observes, that during the days of this solemnity, horses and asses were left at rest, and were driven up with crowns, &c. on account of its being the feast of Neptunus Equesiris. Fellus says, the cavalcade was performed with mules; it being an opinion, that this was the first animal used to draw the car.

Servius gives us to understand, that the consualia fell on the thirteenth of August; Plutarch, in the life of Rumulus, places them on the eighteenth, and the old Roman calendar on the twenty-fifth of that month.

CONSUBSTANTIAL, in Theology, a term of like import with coexistential; denoting something of the same substance in kind with another. That this is the meaning of the term ipsores has been shown by Petrarius, Curellys, Gudwyth, Le Clerc, Clarke, &c. &c.

The orthodox believe the Son of God to be consubstantial with the Father.

The term ipsores, consubstantial, was first adopted by the fathers.
fathers of the council of Nice, convened A. D. 325, and consisting of 318 bishops, to express the orthodox doctrine more precisely, and to serve as a barrier and precaution against the errors and subtleties of the Arians; who owned every thing excepting the confubstantiability.

At the Nicene council, Eunæbius proposed a creed, in which he avoided the word ἰδιός, and anathematized every impious hereby, without specifying any; but his advice was not followed; ἰδιός was inferred, and the Arian doctrines were anathematized. Disputes ensued among the bishops concerning the meaning and the conceptions of the word ἰδιός. Eunæbius assented to it, declaring at the same time in what sense he understood it. His sense of confubstantial was, that the Son of God was not like created beings, but received his existence and his perfections from the Father in a different and an ineffable manner. Others gave other senses to it; and the debate, says Sozomen, the ecclesiastical historian, (i. 23. et Soz. ii. 18.) was like a battle fought in the dark. Sozomen however was a confusantialist, so far as even to believe that miracles were wrought by the Monks in favour of that doctrine; though he intimates, that the bishops of each party disputed about words of which they had no ideas, and charged one another with conceptions and inferences, which neither side would own. By the word ἰδιός the Nicene fathers meant, not the fame numerical individual substance, but the same general substance or subsistence. As amongst men, a son is ἰδιός with his father, that is, of the same human nature; so, in their opinion, the Son of God is ἰδιός with the Father, that is, of the same divine nature. By this word, therefore, they intended to express the same kind of nature, and so far a natural equality. But according to them, the natural equality did not exclude a relative inequality; a majority and minority, founded upon the everlasting difference between giving and receiving, causing and being caused. They had no notion of distinguishing between person and being; between an intelligent agent, and an intelligent active subsistence, subsistence, or entity. When they said, that the Father was God, they meant that he was God of himself, originally, and uncreated, Θεός ἵναι ἰδιός, and ὁ Θεός. When they said that the Son was God, they meant that he was God by generation or derivation, ὁ Θεός ἴδιός. The unity of God they maintained; and they defended it, first, by considering the Father as the first cause, the only undivided and self-existing; secondly, by supposing an intimate, inexpressible, and incomprehensible union, connection, indwelling, and co-existence, by which the Father was in the Son and the Son in the Father; and thirdly, by saying, that in the Father and the Son there was an unity of will, design, and content, and one divine power and dominion, originally in the Father, and derivatively in the Son. In process of time Christians adopted a notion, that the Son was τοῖς ἰδιόσι to ἰδιόσι, of the same individual substance with the Father and the Holy Spirit; and they seem to have done this with a view of securing the doctrine of the unity.

The Arians declared, that the word was God, as having been made God; but they denied that he was the same God, and of the same substance, with the Father; accordingly, they exerted themselves to the utmost to abolish the use of the word. The emperor Constanine used all his authority with the bishops to have it expunged out of the symbols; but it still maintained itself, and is at this day, as it was then, the distinguishing criterion between an Arian and an Arian.

Sandius will have it, that the word confubstantial was unknown till the time of the council of Nice; but it is certain it had been before proposed to the council of Antioch, held A. D. 275, in which Malchion directed and governed, and in which Paul of Samosata had been condemned; though the had there the fortune to be rejected. Curcellus, on the other hand, maintains, that was an innovation in doctrine in the council of Nice, to admit an expression, the use whereof had been abolished by the council of Antioch.

According to St. Athanasius, the word confubstantial was only condemned in the council of Antioch, insomuch as it implied the idea of a pre-existent matter, prior to the things formed of it; now, in this sense, it is certain, the Father and the Son are not confubstantial, there having been no pre-existent matter.

In another council, held at Antioch, A. D. 341, consisting of about 100 bishops, the Arians made a creed and left out the term ἰδιός; but wanting it to be approved by both parties, they called the Son the unchangeable image of the essence, counsel, and power of the Father, the first born of every creature. The disputes, however, between the confubstantialists and the Arians, and also the Semi-Arians or viz. the homoeans, continued to be carried on with great violence, particularly in the Eastern part, for several years. One remarkable difference has been observed between the creeds which were proposed by the contending parties. The confubstantialists drew up their creed with a view to exclude and diftrust the Arians; whereas the Arians had no design to distrust the confubstantialists, but usulually proposed creeds to which Athanasius himself might have assented; so that if the compilers were Arians, their creeds were not Arian. The Semi-Arians agreed with the Arians in rejecting the word ἰδιός, but differed from them in excluding the perfections and dignity of the Son higher than the Arians did, and in affirming that he was ἰδιός of like substance and like to his father in all things. Dr. Clarke's doctrine, in his "Scripture Doctrine, &c." as stated by Le Clerc, (Bibl. Choix. xxvi. 419) seems to be the same with that of the Nicene council, excepting that he uses not the word "confubstantial.

Before the end of the fourth century the confubstantialists differed and disputed among themselves, whether in the Trinity there were three hypostases, or one hypostasis. See HYPOSTASIS AND TRINITY.

CONSUBSTANTIATION, a tenet of the Lutheran church, with regard to the doctrine of the real presence of Christ, or the manner of the change made in the bread and wine, in the eucharist; though the term confusantiation was substituted in the room of transubstantiation, at the close of the thirteenth century, by John, named Pungens Afinus, a doctor of the university of Paris.

The divines of that profession maintain, that, after consecration, the body and blood of our Saviour are substantially present, together with the substance of the bread and wine; which is called confusantiation, or proposition.

This notion, as the bishop of Meaux justly observes, has all the disadvantages, which the Romanists, and Sacramentarians, charge on another, without having a single advantage that can be claimed by either. It has all the absurdity which the latter charge upon the former, insomuch as it represents the same body existing in different places, at the same time; and insomuch as it represents a substance existing without its accidents, or under the accidents of another substance; but has not the advantage of simplicity which the Roman doctrine has. In interpreting literally the words, "this is my body." On the Lutheran hypothesis the expression ought to have been, not "this is my body," but "in, with, and under this is my body." For the Lutherans
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therans maintain that the bread remains unchanged, and is that which is seen, touched, and tasted; but that the body of Christ, the same which he had upon the earth and now in heaven, accompanies the bread. Hence it appears, that the words are to be understood neither according to the letter, nor according to any figure of speech ever heard of before. It is neither literally Christ's body, nor figuratively the sign or symbol of his body; but it is something with which his body is accompanied. The Lutherans, by maintaining this doctrine of consubstantiation, were obliged to adopt another hypothesis not less absurd, viz. the ubiquity, or the omnipresence, and consequently the immensity of the body and human nature of Christ; hence they were called Ubiquitarians. See also Impanation, Transubstantiation, and Lutheranism.

CONSEUGRA, in Geography, a town of Spain in New Cadile, containing two parishes and three convents. It belongs to the knights of Malta; 25 miles S. S. E. from Toledo.

CONSETUDINIBUS ET SERVIITUS, in Law, a writ of right, which lies for the lord against the tenant to foreclose his lord of the rent, or service due to him, by cultus, or tenure, for his land. This compels a specific payment or performance of the rent or service, and there are also others, whereby the lord shall recover the land itself in lieu of the duty withheld.

CONSUL, the appellation that was given to the first, or chief, magistrate in the Roman government, vulgarly and commonly called the Roman Commonwealth; though it was composed of royalty, aristocracy, and democracy, as much as the government of Great Britain is, and was, perhaps, in several respects, the most energetic and efficient mixture of these three simple forms that has ever existed in the world, particularly for the purposes of conflict and security against subjugation.

After the destruction of royalty at Rome, and the expulsion of Tarquinius Superbus, and his family from thence, in the 244th year of the city, a confular form of government was established in the 245th year in its stead; the people choosing to have some share in the management of public affairs themselves; they accordingly chose two officers, or magistrates, annually, who were invested with sovereign authority, and were originally called pretors, a praebenda, according to some writers, but a prætexta according to others. These were afterwards called consules, a consulado, because it was their duty to consult with the senate, with the people, and with each other. From their acting as judges, they were called iudices; or from their presiding supreme command they were denominated by the Greeks' ΘΗΑΤΟΝ. The first consuls were Brutus and Colatinus. The office of the consuls lasted a year; and if either of them died in the course of the year their consulate, a new one was to be elected. In the beginning of the republic the consuls entered on their office at different times; at first, on the 23rd or 24th of February, (vi. or vi. Kal. Mart.) the day on which Tarqin was said to have been expelled, which was held as a festival, and called "regimini fœbus," afterwards on the 1st of August, (Kal. Sext.) which was at that time the beginning of the year, i. e. of the consular, not of the civil year, which always began with January;—in the time of the Decemviri, on the 1st of May, (Id. Maii);—about 50 years after, on the 1st of December, (Id. Decemb.);—then on the 1st of July, (Kal. Quint.), which continued till near the beginning of the second Punic war, A. U. 550, when the day came to be the 15th of March, (Id. Mart.):—at last, A. U. 598, or 600, it was transferred to the 1st of January (in Kal. Jan.), which continued to be the day ever after. After this, the consuls were usually elected about the end of July, or the beginning of August. From their election to the 1st of January, when they entered on their office, they were called "consules delignati," and whatever they did in public affairs, they were said to do it by their "authority," not by their "power." This interval was made so long, that they might have time to acquaint themselves with the duties of their office, and that inquiry might be made whether they had gained their election by bribery. If, upon trial, they were convicted of that crime, they were deprived of the consulship, and their competitors, who accused them, were nominated in their place. They were also fined, and declared incapable of bearing any office, or of coming into the Senate, by the Calpurnian and other laws. (Cic. pro Sylla, 17 and 32. Cic. pro Cornel. Muren. 23, &c. Sall. Cal. 18.)

On the 1st of January, the senate and people waited on the new consuls at their houses; whence, being conducted to the capitol, they offered up their vows, and sacrificed, each of them, an ox to Jupiter; and then began the exercise of their office, by holding the Senate, confuting it about the appointment of the Latin holidays, and about other things relating to religion. Within five days they were obliged to swear to observe the laws, as they had done when elected.

The consuls were at first chosen only from among the Patricians, but afterwards also from the Plebeians. L. Sextius was the first plebeian consul, and the second year after him Lucius Stolo; from whom the law, ordaining one of the consuls to be a plebeian, was called "lex Licinia." Sometimes, but rarely, both consuls were plebeians; the patricians generally engrossed this honour. The first foreigner who obtained the consulship, was Cornelius Balbus, a native of Cadiz; who became so rich, that, at his death, he left to each of the citizens, refiding at Rome, 25 drachms, or denarii, i. e. 165. 12d.

The legal age for enjoying the consulship (vestas con- fusaria) was 43; and whoever was made consul at that age, was said to be made in his own year; but we meet with some few exceptions from this rule. (See Ages.) Before any person was made consul, it was necessary for him to have gone through the inferior offices of quaestor, exilium, and pretor. No one could be created consul a second time till after an interval of ten years. But these regulations were not strictly observed.

The insignia of the consuls were the same with those of the kings, except the crown; namely, the toga praetexta, fella curia, the scephe, or ivory staff, and 12 lictors, with the fasces and securis. He who had the greater number of suffrages was called "Consul prior," and his name was marked first in the calendar; he also had the fasces first, and usually presided at the election of magistrates for the next year. All persons went out of the way, uncovered their heads, dismounted from their horses, and rode up to the consuls as they passed by them. When a pretor happened to meet a consul, his lictors always lowered their fasces. Verrius, called Poppicola, took away the securis from the fasces; i. e. he took from the consuls the power of life and death, and only left them the right of scourging, at least within the city; for without the city, when invested with military command, they still retained the securis, i. e. the right of punishing capitally. Poppicola likewise made a law, granting every one a liberty of appealing, from the consuls to the people; and that no magistrate should be permitted to punish a citizen, who thus appealed: a privilege which was also enjoyed under the kings. The consuls originally possessed kingly powers, both in civil and military
military matters. But afterwards, when the consuls came
to be much employed from home, or abroad in war, and
could not be present either to hear or determine civil causes,
there was an officer constituted, under the designation of \textit{praetor urbanus}, and frequently called by Ciceron \textit{praetor Romanus},
with power to judge matters of law between citizen and
citizen. And for the convenience and accommodation, in
this respect, of the great number of strangers that were
always at Rome, another officer was appointed to judge
cases between them, with the appellation of \textit{praetor person-}
grinus. And, as provinces came to be added to the Roman
state, and the number of causes was of course greatly in-
creased, there were eight praetors appointed, which number
continued till the time of Julius Caesar, who raised it to ten.
The consuls, whilst they remained in Rome, and before
they led out Roman armies into the field, were masters of all
public affairs. For all the other magistrates, the tribunes of
the people alone excepted, were subject to them, and bound
to obey their commands. They introduced embassadors
into the senate and gave them audience; and they received
all letters from the governors of provinces, and from foreign
kings, and states. They also proposed to the senate the
subjects of their debates, and directed all the forms that
were observed in making their decrees. It was equally a
duty likewise, belonging to their office, to attend to those
affairs that were transacted by the people; to summon, or
call together their general assemblies; to report to them,
when assembled, the resolutions of the senate; and to ratify
whatever was determined by the greater number. The laws
which they proposed, and got passed, were commonly called
by their name. The year was named after them, as it used
to be at Athens, from one of the archons. The consuls
had the command over the provinces, and could, when
authorized by the senate, call perions from thence to Rome,
and punish them. (See Province.) Their authority was
so great, that kings, and foreign nations, in alliance with the
republic, were considered to be under their protection. In
dangerous conjunctures, the consuls were armed with abso-
lute power by the senate. In all the preparations that were
made for war, as well as in the whole administration, and
management of things in the field, they possejed an authority
almost absolute. For to them it belonged to impose on the
allies whatever services they judged necessary or expedient;
to appoint the military tribunes; to enrol the legions, and
make the necessary levies; and to inflict punishments in the
field on all that were subject to their command. In addi-
tion to all this, they had the power to expend whatever
sums they might think convenient, or requisite, from the
public treasuries, and were attended for that express purpose
by a quaestor, who was always ready to receive and execute
their orders.

When a Roman army encamped, the consular tent was first
pitched, and the ground on each side of it marked out for
it, and on the breaking up of a camp, it was the first tent
that was permitted to be struck; and one entire company of
soldiers were always flattened round it.

When an action had taken place, in which any of the
soldiers had shown signal proofs of courage, the consul
assembled the troops together, and commanded those to
approach who had distinguished themselves by any eminent
exploit. And after bowing on each of them separately,
or apart, the commendation that was due to that particular
instance of their valor, and after recounting likewise all
their former actions that had ever merited applause, he
then distributed among them the following rewards:—To him
who had wounded an enemy a javelin;—To him who
had killed an enemy, and flung him of his armour, a
goblet, if he were in the infantry; and if in the cavalry, a
javelin in ancient times, but afterwards furniture for his
horse. These rewards, however, were not bestowed on
soldiers, who, in a general engagement, or in the attack of a
city, had wounded or spoiled an enemy; but on those only,
who in separate skirmishes, and when any occasion offered,
in which, though they were not necessarily required to
engage in single combats, threw themselves voluntarily into
danger, and with danger, provoked the combat. In taking
a city by storm, those who first mounted the walls were
honoured by the consul with a golden crown. And those
who saved the lives of any of the citizens, or of the allies, by
covering them from the enemy in the time of battle, received
premises from the consul, and were also crowned by the
persons whom they had thus preferred.

Although the consuls were the dispensers of military re-
wards and punishments; although they were entrusted with
the absolute direction of the preparations that were made for
war, and exercised an uncontrolled authority in the field;
although their powers and authorities, when they were pre-
fent in Rome, made strangers sometimes suppose the govern-
ment to be a kind of simple royalty; they were in truth, so
dependent in different respects, both on the senate and the
people, that without their aid, they were unable to accom-
plish any design. Armies require a continual supply of
necessaries. But neither corn, nor habits, nor even the
military apparatus, could at any time be transmitted to the
legions, without an express order of the senate. It was also
the senate that either compelled the consuls to leave their
designs imperfect, or enabled them to complete the projects
that they had formed, by sending a successor into each of their
several provinces on the expiration of the annual term,
or by continuing them in their respective commands. The
senate also had the power of either aggrandizing and ampli-
fying the victories that were gained, or of depreciating and
debasing them. It was also necessary for the consuls, how-
ever far they were removed from Rome, to preserve the
good affections of the people. For though the consuls might
make treaties, the power of ammulling, or ratifying, rested
entirely with the people. And what was of still greater
moment, the consuls, on quitting their office, were bound
to submit the whole of their past administration to the judg-
ment of the people. On this occasion they made a speech,
and swore that they had done nothing against the laws.

Consuls were even continued under the emperors after the
republic was destroyed, but consuls were not more than little
more than an honourable title; which, however, the people
were fond of keeping up; as stemming it some remains of their
ancient liberty. As long as the emperors condescended to disfigure
the servitude which they imposed, the consuls were still
elected by the real or apparent suffrage of the senate. From
the reign of Diocletian, even these vestiges of liberty were
abolished, and the successful candidates, who were invested
with the annual honours of the consulship, attempted to
abolish the humiliating condition of their predecessors.
In the epistles which the emperor addresed to the two consuls
elect, it was declared, that they were created by his sole
authority. The title of consul, however, though the real dignity and
substantial power that accompanied it were lost, was still
the most splendid object of ambition, the noblest reward of
virtue and loyalty. The emperors themselves, even after
Constantinople became the seat of empire, who disdained the
feint shadow of the republic, were conscious that they
acquired an additional splendour and majesty as often as they
assumed the annual honours of the consular dignity. It
wilted for a long time, and at last the distinction of
consuls finally ceased, in the 13th year of Julian, A.D. 361,
whose despotical temper might be gratified by the extin-
guishment of a title, which alarmed the Romans of their
ancient freedom; after him, no emperor either created any
consul, or confirmed the dignity of consuls. Baal is the last in
the consular list, for the year 541. By this time, the dignity
was depreciated to that degree, that it was conferred on the
nearest per sons: indeed, Justinian endeavored to retrieve it 25 years after,
and created himself consul, but without effect. Indeed, the annual consuls
long lived in the minds of the people; they applauded the graci-ouss condescension of successive princes, by whom it
had been suppressed by custom, could be abolished by a law
of Leo the philosopher. Afterwards the title was visited,
as we learn from the emperor himself.

From the establishment of the republic, and the consulate
under L. Jun. Brutus, and L. Turius Collatinus, to the con-
sulate of Baal, i. e. from the year of Rome 244, or 245, 599
years before Jesus Christ, to the year of Rome 1394, the
space of 299 years, the years were accounted by the con-
suls; but from the time of Baal, in the year of Chrisl. 541,
we find no mention made of consuls, or confuls; but the

time was then computed by the years of the emperors'
reigns, the judicature, and those of the Christian era.

Indeed, for some time after the consulate of Baal, the
years are marked thus; p. c. 541, consulatum Baalii, 1, 2, 3, &c.
(See the Fasti Consularia o' M. D'Ambrois.) That
author reckons 100 pairs of consuls, besides the substitute
consuls, jujfeeli, elected to supply vacancies by death, and
yet there were but 1049 years, and consequently only so
many consuls.

The perpetual consulates of the Eastern emperors, which
comprise the Fasti Byzantini, commenced in the year of Christ
507, and ended in 668, in the last year of Constan-

Ivantine Pagonatus would have the consulates insepara-
ble from the empire; which it continued to be till the time
of Constantine Porphyrogenetus.

In this form of government, the empire and consulate
were closely united, that the emperor Irene would needs assume
the consulatc when the whole was only regent of the empire.

But the French kings, those of Italy, and the Saracen
princes who commanded in Spain, taking on them the title of
consul, as well as emperors of Constantinople; these last
defiled it, and laid it aside; so that the name was only
continued to the magistrates of some cities, and certain other
officers, as is shown by F. Pagi.

Under the emperors there were ordinary consuls, honorary
consuls, and jujfeelii; which last also subsisted in the time of
the republic.

In the middle age, we find the word consul used for comes,
count, and proconsul, for viccount; as is observed by Spel-
man, and De Marco.

And thus consul, in our law books, signifies an earl. Draf-
lib. i. cap. 8, tells us, that as comes is derived from comita, so
consul is derived from consulendo; and in the laws of
Edward the Confessor, mention is made of viccomes, and
vicconsules.

Consul, at present, is used for an officer established by
virtue of a commission from the king, and other princes, in
the ports and factories of the Levant, on the coasts of Africa,
Barbary, Spain, and other foreign countries of any con-
siderable trade; to facilitate and dispatch business, and pro-
\nc\n\nc\ntect the merchants of the nation.

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These commissions were never granted to persons, as con-
suls of the French nation, under the age of thirty years.
When the consulate is vacant, the most ancient of the de-
puties of the nation were to discharge the function thereof,
till the vacancy should be filled up by the king.

The consuls are to keep up a correspondence with the
ministers of England residing in the courts wherein their
consulates depend. Their business is to support the com-
merce and interest of the nation; to dispose of the sums
given, and the presents made, to the lords and principals of
places, to obtain their protection, and prevent the insults
of the natives on the merchants of the nation. There are
also consuls of other nations established in the Levant, es-
pecially French and Dutch.

Consuls also denote judges elected among the merchants
and dealers, in ports and trading towns, chiefly in France;
to terminate, gratia, and on the spot, without any process,
such differences and demands as may arise relating to their
merchandizes, bills of exchange, and other articles of com-
merce.

The first jurisdiction of consuls established in France, is
that of Tholouse; the edict of whose establishment bears
date 345, under the reign of king Henry II.; that of Paris
followed fourteen years afterwards. By degrees, they were
established in most of the considerable trading towns in the
kingdom.

Consul, Chief, or Premier Consul, the chief or chief of
the magistrates, who each of them bore the name of consul
in the late constitution of France, which has been succeeded
by its present military dictatorship. Napoleon Buonaparte,
the present emperor of France, was appointed chief consul,
in consequence of the revolution that took place in 1799.

Consular, of or belonging to a consul: as for exam-
ple, a consular camp, a consular army, the consular digni-
ty, the consular authority, and so on.

Consular comitia, and medall. See the substantives.

CONSULATE, or Consulship, the office of consul,
which was instituted by the Romans, in the year of Rome
245, after they expelled Tarquin the Proud.

CONSULTATION, in Law, a writ whereby a cause,
formerly removed by prohibition from the ecclesiastical court
to the king's court, is returned thither again.

If the judges of the king's court, upon comparing the
lith with the fuggition of the party, find the fuggition
false, or not proved; and therefore that cause to be wrong-
fully called from the court-christian; then, upon such deli-
eration, or consultation, they decree it to be returned
again, and the writ obtained herein is called a consultation.

And, even in ordinary cases, the writ of prohibition is
not absolutely final and conclusive. For, though the ground
be a proper one, in point of law, for granting the prohibi-
tion, yet, if the fault that gave rise to it be afterwards es-
hlished, the cause shall be remanded to the prior jurisdiction.
If, e. g. a culprit be placed in the spiritual court, a pro-
hibition ought to go; but if he be accused in a civil court
that court has no authority to try it; but, if the fact of such a custom be brought to a com-
petent trial, and be there found false, a writ of consul-
tation will be granted. For this purpose the party pro-
hibited may appear to the prohibition, and take a declaration,
(which must always proceed, the fuggition, and so plead to
issue upon it; dazing the contempt, and traversing the ca-
se upon which the prohibition was granted; and if the
issue be found for the defendant, he shall then have a writ of
consultation. The writ of consultation may also be, and is
frequently granted, by the court without any action brought,
which, after a prohibition filed, upon more sufficient es-

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fication, the court are of opinion that the matter suggested
is not a good and sufficient ground to stop the proceedings
below. Thus careful has the law been, in compelling the
interior courts to do ample and speedy justice; in preventing
them from transgressing their due bounds; and in allowing
them the undisturbed cognizance of such causes as by right,
found on the usage of the kingdom or act of parliament,
do properly belong to their jurisdiction. Blackf. Com.
vol. iii.

CONSUMMATE ESTATE. See Tenant by curtesy.

CONSUMMATION, the end, period, or completion,
of any work.—Thus, we say, the consummation of all
things: meaning the end of the world. By the incarnation,
all the prophecies are to be consummated.

Consummation of marriage denotes the last act of mar-
rriage, which makes its accomplishment.

CONSUMPTION, in Medicine, popularly named a de-
cline, is a generic term, occasionally applied to different
diseases, the most obvious symptoms of which are a gradual
decline of the strength and functions of the body, and a
diminution of its bulk, in consequence of the decrease or con-
sumption, as it were, of the fat and muscular parts. From
whatever cause, therefore, the nutrition of the body is im-
peded, consummation will be the consequence. The nutri-
tion of the body may be impeded either by force great in-
ternal disease, which disturbs the functions, especially that
of digestion; or by deficiency of nutrition; or by great
evacuations or discharges of blood, or fluids secreted from
the blood. These considerations have led no theologians
to treat of consumption under three divisions or genera, with
the titles of Phtisis, Tubes, and Ateophia: the first being
produced by internal organic diseases; the last by the
deficiency, or the abstraction, or corruption, of nutritious
matter.

1. Phthisis, from signifying consumption in general, is
confined to that species which originates from disease of the
lungs: this form of consumption being the most frequent
and fatal. It is defined "emaciation, with hectic fever,
cough, and commonly with purulent expectoration." The
emaciation is occasioned by the disturbance in the function
of digestion, which the daily fever produces; by the im-
pediment to the function of respiration, which the diseased
lungs are unable to carry on; and by the great discharges
by expectoration, sweating, or diarrhoea, which latter fre-
cquently alternate with each other.

2. Tubes, which, in the Latin language, is synonymous
with phthisis in the Greek, has been arbitrarily restricted
by no theologians to that form of consumption, which is not ac-
compained by cough. It is defined, "emaciation, with hectic
fever." Any local disease of long continuance, such as afeceles,
ulcers, &c. which excites a hectic fever, may become the origin of a
	
Tubes. But the most frequent occurrence of tubes is observed in scrofulous habit, the for-
cula being always flow in its progress: and one of the
mmost common varieties of tubes arise, where scrofula at-
tacks the glands of the mesenteric. In this case, emaciation is
produced, not only by the disturbance of functions, and
the events of the hectic fever, but by the physical imped-
iment to the nutrition of the body, occasioned by the morbid
condition of the mesenteric glands, through which the chyle
cannot pass, in order to enter the thoracic duct, and thence
to be poured into the blood-vessels.

3. Ateophia, derived from the primitive particle α, and
νηθρία, meaning a defect of nourishment, has been adopted
to denote the simple emaciation and loss of strength, which
is not accompanied with hectic fever, nor originates from
any organic disease; but depends altogether on the priva-
tion, corruption, or abstraction, of that which would other-
wise support the strength of the body. It is defined, "em-
aciation, without fever." Hence atropia occurs in those
who have suffered great evacuations, as from salivation, ha-
orrhage, sweat, laceration, &c.: in those from whom nutriment is abstracted in undue proportion to their strength and
digestive powers, as in nurses suckling stout children, or
continuing them at the breast too long; and in those whose
nutriment is corrupted, as the falt provisions, which excite
scars.

For a view of the nature and requisite treatment of the
different kinds of consumption, see the following articles:

Tubes Mesenterica (or Mesenteric Consumption),
Cullen's Synopsis Nofol. Clafs i. ord. 4. and Clafs iii.
ord. 1.

CONSUMPTION, Pulmonary, the phthisis pulmonalis
of medical writers, from δίσας, or δίσος, constringe, con-
sume, a delighting and very fatal disease, distinguished by the oc-
urrence of a frequent cough, with expectoration of puriform
matter, hectic fever, emaciation, and debility; to which,
in the latter stages, colliquative sweats, often alternating
with diarrhoea, supervene.

In this disease the number, degree, and progress of the
symptoms are extremely various, in different cases. It
usually commences in an inoffensive manner, with a light
and short cough, which is often hectic remarked by those afflicted
with it, but soon becomes habitual; or with an occasional
cough, which is more severe. At the same time, the
breathing becomes easily hurried by any bodily motion, the
patient grows thinner, and becomes languid and indolent.
In this state be sometimes continues for a year, or even for
two years, without making any complaint, excepting that
he is affected by cold more readily than usual, which fre-
cquently increases his cough, and produces catarrh. This
however, is sometimes relieved, is supplanted to have arisen
from cold alone, and therefore gives no alarm either to the
patient or to his friends, nor leads them to take any precau-
tion. But upon some occasion of catching cold, as we com-
monly speak, the cough becomes more considerable; is par-
ticularly troublesome, when the patient lies down at night,
and in this state continues longer than is usual in the case of
a simple catarrh. This may more particularly attract at-
tention, if the increase and continuance of cough occur during
the summer season.

The cough, in many instances, continues for a long time
dry, or without any expectoration: frequently, however, it
is accompanied, from the first, with an expectoration of a
blackish or blueish mucus, or of tough phlegm; the expec-
toration being generally most considerable in the morning,
in confluence of the accumulation of the matter during
sleep. This matter becomes by degrees more copious, more
vivid, and more opake; at length a yellow or greenish
colour, and of a purulent appearance, sometimes broken
with blood. As these changes take place, and the cough
increases, the breathing at the same time becomes more dif-
cult, and the emaciation and weakness go on also increas-
ing.

In the female, as the disease advances, and sometimes
early in its progress, the menstres cease to flow; and this cir-
cumstance, although doubtless an effect, the sex themselves
are generally disposed to believe to be the sole or principal
cause of the disease. During this progress some pain is
commonly felt in the thorax, at first under the sternum,
especially, or almost solely, on the occasion of coughing:
but very often there is a pain in one side, sometimes dull
and oppressive, sometimes sharp and shooting, and such as
to prevent the person from lying easy upon that side. Even
when
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when no pain is felt, it generally happens that phthisical persons cannot lie easily on one of their sides, the difficulty of breathing being increased, and the cough excited by the attempt.

These symptoms have seldom continued long, before the pulse becomes frequent, sometimes to a considerable degree, without much of the other symptoms of fever. As it proceeds, the skin becomes dry and hot, especially the palms of the hands and soles of the feet; a circumferibled flush appears on the cheeks; transient chills are often felt by the patient, or he is exceedingly liable to cold; and commonly a regular morning and evening febrile paroxysm takes place, the evening exacerbation being always the most considerable, and terminating in sweats during the night.

The mind is generally little or not at all impaired during the progress of pulmonary consumption; sometimes it is even more acute than in the previous state of health; and the patient is generally confident of recovery, and his spirits buoyed up by hope to the last extremity. But the gradual loss of flesh and strength, the sharpness of the features, the pearly whitenss of the eyes, the incursion of the nails, and sometimes the loss of the hair, but too evidently mark the decay of the bodily functions. At length a colliquative diarrhœa, sometimes occurring together, but most commonly alternating, with the night sweats, contributes still farther to reduce the patient's strength; and death is frequently preceded by oedema of the feet and legs, and apæthesia in the mouth and throat, and occasionally by delirium.

Great numbers of people are repeatedly exposed with impunity to the circumstances which excite consumption of the lungs: it is only on a constitution of a peculiar nature, predisposed to the disease, that these exciting causes operate. This predisposition is frequently hereditary, descending from parents whom the disease had attacked, or who had, at some period of their lives, been afflicted with some form of scrofula. It is marked by a peculiar inattentivity and weakness of the vascular system, more especially of the lungs: insomuch as the person is subject to frequent catarrh, and spitting of blood. It is also distinguished by external peculiarities of form and appearance. Persons poising what has been denominated the fagunee temperament, namely, having fine skin, with large veins, soft hair, light eyes, a florid complexion, tall and thin person, long slender neck, narrow chest, and projecting shoulders, may be considered as having the phthisical predisposition: and those of the fagunee-melancholic temperament, combining with the fine skin and complexion, and slender form of the former, the dark hair and eyes, and dilated pupils of the melancholic temperament. This combination connotes in general a temperament of peculiar beauty; but in the eyes of the medical phlogistonists, a tinge of its delicacy is not the least imprompt which it excites. Phthisis sometimes occurs also in persons who may be said to possess a fagunee-phlegmatic temperament, i.e. who have the slender form and delicate constitution, with an habitually pale complexion, and without the disposition to acute inflammation, which belongs to the fagunee: it occurs occasionally too in temperaments almost entirely melancholic. See Temperament.

In those who have a constitutional predisposition to the phthisical state of the lungs, the disease is excited by various causes of irritation in those organs. Thus it is frequently induced by common inflammation of the lungs, or their membranes, by pleurisy, peripneumony, catarrh, whooping-cough, asthma, and the cough connected with measles; by frequent over-exertion of the lungs in speaking, singing, or blowing musical instruments; by inspiring certain kinds of dust or vapour; by haemoptysis, or spitting of blood; by sudden variations of the atmospheric temperature; by compressing the chest by tight bandages, &c. Of some of these causes we shall speak more particularly.

A great majority of the cases of pulmonary consumption is referred, by the sufferers, to a common cold or catarrh, as their origin; the expectoration of mucus, which belongs to catarrh, being gradually changed to an expectoration of pus, and hectic fever superimposing. But Dr. Cullen thinks that this supposition is not easily to be admitted; insomuch as catarrh is properly an affection of the mucous glands of the trachea and bronchies, analogous to conyza, and less violent kinds of fore-throat, which very seldom terminate in suppuration. He is of opinion, that the apparent catarrh, in such instances, was in fact the beginning of phthisis, for which it may have been mistaken, as the resemblance between the two is so great as commonly to preclude the means of discrimination. This difficulty, however, he admits, presses upon us the necessity of paying minute attention to every catarrhal cough, especially in those who bear marks of the temperament which is predisposed to consumption. This observation has been inculcated, indeed, from ancient times. "Quod si mai linea eft," says Celsus, "et vera phthisis eft, inter initia protinus occurrere necassarum eft; neque enim facie hic morbus, cum inveteraverit, evincitur," lib. in cap. 22. The attention of friends and parents cannot, indeed, be too strongly urged upon this point: to neglect the slightest catarrhal affection, which continues longer than the usual short period of a few days, is to neglect the only period of suppressing a disease, which almost invariably tends to fataly.

Hæmoptysis, or spitting of blood, is enumerated among the causes of consumption, and certainly very frequently proceeds it. But this occurrence may, perhaps, be confidered far more than catarrhal symptoms, as a sign of the commencement, and not a cause, of the disease; more especially when it occurs independently of external violence. Numerous infallences of hæmoptysis have occurred, from blows and wounds, in which ulceration did not ensue, or at least was of short duration, and did not materially injure the constitution. But when it comes on without any obvious external cause, and especially in persons of one or other of the temperament already described, ulceration, expectoration of pus, and all the differing symptoms of phthisis are generally to be apprehended. In such cases, there is either a peculiar tenderness of the vascular system in the lungs; or, what is perhaps more generally the fact, an incipient obstruction, as tubercles, which render the small vials liable to give way, when the circulation through them is increased by any exertion, or receives an irregular impetus from the action of coughing occasioned by cold. In this way, catarrh may lay the foundation of phthisis. Spitting of blood, however, if not among the first symptoms, very frequently occurs in the course of the disease, especially in the stage of purulent expectoration.

When inflammation of the lungs terminates in extensive suppuration, producing one or more collections of purulent matter, termed vomices, the great irritation often produces hectic fever, which, together with the expectoration of pus, continues after the vomices burst, and the patient is cut off with the ordinary train of symptoms belonging to phthisis. Persons who are occupied in various employments, by which the air they breathe is contaminated with various infallences, in the form of a fine powder, are peculiarly liable to be seized with phthisis. Thus hair-dresters, bakers, masons, bricklayers'-labourers, laboratory-men, coal-heavers, and chimney-sweepers, are frequently subject to the most obdurate pulmonie diseases; as are also, in an equal degree, the
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dressers of flax and feathers, and the workmen in the ware-
houses of leather-fellers. Many persons, thus engaged, 
struggle a long time with a constant, hard, troublesome cough, 
which at length terminates in consumption. See 
Willan on Diseases in London, p. 301.
The exanthematic disease, such as small-pox and 
measles, the latter of which, more particularly, often lays 
the foundation of consumption, seem to operate by occa-
sioning some morbid change in the constitution, which 
may be considered rather as a predisposition than an actual state 
of disease. Dr. Cullen attributes this change to an anomaly 
left in the fluids by these exanthemata, which he believes to 
be the same with the anomaly which prevails in scrofula. 
But if we would avoid hypothetical language, all that can 
be said is, simply, that a predisposition to phthisis and to 
scrofula is occasioned by these diseases. The measles, in-
deed, may not only induce the predisposition, but, by the 
irritating cough which it leaves behind, may actually occa-
soon a consumption of the lungs.
The venereal disease, or the irritation of the mucous 
membranes necessary for its cure, or both combined, appear 
also to excite a predisposition, and lay the foundation of 
consumption.

Dr. Cullen has enumerated, among the exciting causes of 
phthisis pulmonalis, and as the most frequent of them all, 
tubercles in the lungs. In the majority of cases these un-
doubtedly exist; but we must consider them as constituting 
the essential part of the disease itself, and, if not originally 
induced by some of the causes above enumerated, excited into 
a state of activity by some one of them, perhaps most fre-
cently by the common catarrh. Of the pulmonary tu-
bercles, the best morbid anatomy of the times gives the 
following account.

There is no morbid appearance, he says, so common in 
the lungs as that of tubercles. These consist of rounded, 
firm, white bodies, interspersed through their substance.

They are, he believes, formed in the cellular structure, which 
connects the air-cells of the lungs together, and are not a 
morbid affection of glands, as has been frequently imagined.

There is no glandular structure in the cellular connecting 
membrane of the lungs; and on the inside of the branches 
of the trachea, where there are follicles, tubercles have never 
been seen. They are at first very small, being not larger 
than the heads of very small pins; and in this case are fre-
cently accumulated in very small clusters. The smaller 
tubercles of a cluster probably grow together, and form one 
larger tubercle. The most ordinary size of tubercles is about 
that of a garden pea; but they are subject in this respect to 
much variety. They adhere pretty closely to the substance 
of the lungs, and have no peculiar covering or capulse, and 
have little or no vascularity. When cut into, they are found 
to consist of a white smooth substance, having great firmness, 
and often contain in part a thick curdy pus. But when the 
put is in considerable quantity, it is thinner, and resembles 
very much the pus from a common sore. In cutting into 
the substance of the lungs, a number of absceses is some-
times found, from pretty large tubercles having advanced to 
the extent of suppuration. In the interstices between these tu-
bercles, the lungs are frequently of a harder, firmer texture, 
with the cells in a great measure obliterated. The texture 
of the lungs on many occasions, however, round the bound-
aries of an abscence, is perfectly natural.

I have sometimes, Dr. Wallis continues, seen a number of 
small abscesses interpersed through the lungs, each of which 
was not larger than a pea. The pus in these is rather thicker 
than what arises from common inflammation, and resembles 
serous pus. It is probable that these abscesses have been 
produced by a number of small scattered tubercles taking on 
the process of suppuration. The lungs immediately sur-
rrounding these abscesses are often of a perfectly healthy 
structure, none of the cells being closed up by adhesions. 
See Bailey's Morbid Anatomy, p. 66, et seq.

This accurate delineation of the condition of the lungs in 
the last stage of consumption, sufficiently evinces the imposs-
ibility of a cure by medicine, and may contribute farther 
to enforce an attention to its earlier symptoms.

It must not be omitted, however, that although the slighted 
symptoms of catarrh often prove the commence-
ment of a fatal phthisis; on the other hand, catarrh does 
ocasionally put on the appearance of phthisis, yet remain- 

Dr. Willan observes, in his "Reports on the Diseases 
in London," "many persons who had catarrhal coughs in 
March, were farther affected with spitting of blood, thick, 
viscid expectoration, pains within the chest, hectic fever, 
and diarrhoea, interchanging with night sweats, but reco-
vred notwithstanding in the month of April." He con-
cludes "that ulcerations in the lungs had not been produced, 
and that the expectorated fluid, so alarming in its appear-
ance, was perhaps only composed of a puriform secretion, 
and an increased discharge of mucus, circumstances usual 
under other membraneous inflammation." Reports, p. 4 
and 147.

But it must be added, that effusion has shewn, that 
even this condition of lungs has proved fatal, with the usual 
symptoms of phthisis.

To aid in distinguishing whether the matter expectorated 
be pus, or mucus only, several tests have been propounded; 
which, taken together, may afford us the means of an accu-
rate conclusion. 1. The colour; mucus being naturally 
transparent, and pus always opaque. When mucus becomes 
opaque, as it sometimes does, it becomes white, yellow, or 
greenish; but the latter mentioned colour is hardly ever to 
be met with in pus. 2. The consistence; mucus is more 
viscid and coherent, so as not readily to be diffused in 
water; pus is more readily friable, being broken into 
ragged fragments by a little agitation in water. 3. The 
smell; no odour is in general perceived in mucus, but fre-
cently in pus. 4. The specific gravity; it being usual for 
the mucus of the lungs to swim on the surface of water, and 
for pus to sink in it; but in this we may be deceived, as pus 
which has engendered a great deal of air may swim, and 
mucus that is free from air may sink. 5. The mixture 
which is discernible in the matter brought up; for if a yel-
low or greenish matter appears surrounded with a quantity 
of transparent or less opaque and less coloured matter, the 
more strongly coloured may generally be considered as pus. 
6. Chemical tests. Mr. Charles Darwin's experiments shewed 
that the vitriolic acid dissolves both mucus and pus, but most 
readily the former; that if water be added to such a solution 
of mucus, this is separated, and either swells on the surface, 
or, divided into globules, is suspended in the liquor; whereas, 
when water is added to a like solution of pus, this falls to 
the bottom, or by agitation is diffused so as to exhibit an 
uniformly turbid liquor. Again he shewed, that a solution 
of sulphuric acid, after some time, diffuses mucus, and 
generally pus, and if water be added to such solutions, the 
water is precipitated, but the mucus not.

With respect to the pragmas of consumption, its tenden-
cy in general must be considered as extremely bad. In con-
stitutions, where all the delicacy of the temperaments be- 
fore described is observed, and more especially if an hered-
tary predisposition can be traced, the moat trivial symptoms 
are alarming. The particular degree of danger must be esti-

cated from these circumstances, from the mode in which the 
disease commenced, from its duration, and the flowens
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or rapidity of its progres, the number and degree of the symptoms present, and the effects which medicine has already produced. The following aphorisms, the result of Dr. Cullen's observation, are worthy of attention.

"A phthisis pulmonalis, from haemoptysis, is more frequently recovered from, than one from tubercles.

"A phthisis from a suppuration, in consequence of pneumonic inflammation, is that which most rarely occurs in this climate; and a phthisis does not always follow such suppuration, when the abscess formed soon breaks, and discharges a laudable pus: but, if the abscess continue long shut up, and, till after a considerable degree of hectic has been formed, a phthisis is then produced, equally dangerous as that from other causes.

"A phthisis from tubercles has, I think, been recovered: but it is, of all others, the most dangerous; and, when arising from a hereditary taint, is almost certainly fatal.

"The danger of a phthisis, from whatever cause it may have arisen, is most certainly to be judged of by the degree to which the hectic and its consequences have arrived. From a certain degree of emaciation, debility, profuse sweating, and diarrhœa, no paroxysm recovers.

"A mania coming on, has been found to remove all the symptoms, and sometimes has entirely cured the disease; but, in other cases, upon the going off of the mania, the phthisis has returned, and proved fatal.

"The pregnancy of women has often retarded the progress of a phthisis, but commonly it is only till after delivery, when the symptoms of phthisis return with violence, and soon prove fatal."--Furt Lives, parag. 983.

Treatment. It will readily appear, from what has been said above, that the cure of pulmonary consumption must be exceedingly difficult; in the latter stages, perhaps impossible. Many instances, however, have occurred, where the attention of the patient to the incident symptoms, and his early adoption and steady pursuit of proper measures, have averted the fatality of the disease. When it is deeply rooted, alleviation of the sufferings is all that can be hoped for.

The treatment of a beginning consumption will depend much upon the peculiar constitution of the patient, as well as on the nature of its origin, and of the symptoms which it exhibits; but most particularly upon the prevalence of an inflammatory disposition, or of a general debility of the habit; these opposite states being both accompanied by great irritability; and the principal indications will be to diminish the inflammatory action and irritability; and in the latter stages, just mentioned, to avoid debilitating measures, and to support the strength as much as is consistent with the inflammatory irritation that may exist.

Where there is considerable strength, and a complexion flirid, if there is much pain in the chest, or if the pulse be quick and sharp, perhaps small bleedings from the arm may be resort to, and occasionally repeated; or blood may be drawn from the chest, near the seat of the pain, by means of leeches or cupping. But this discharge should be always effected after a cautious examination of the circumstances; for the debility which is apt but too speedily to ensue, may be thus accelerated, and, with it, the worst symptoms of the disease. It is now well understood, that the appearance of the bloody coat on the blood drawn, is by no means alone an evidence of the necessity of drawing more; for it will appear in phthisis, nearly as long as the arteries have power to propel it. The old doctrines respecting the bloody coat, have doubtless led to much practical error; but no one now considers pregnancy a disease which requires constant bloodletting; or ues the lancet in the hot phase of an intermittent fever, although under both these circumstances, the bloody coat is constantly found. In consumption occurring, as it most commonly does, in delicate habits, the practice of repeated venesection decidedly accelerates the fatal course of the disease. Blilters, on different parts of the chest, will better answer the purpose of relieving a local inflammatory disposition. Blities and fociata have a similar effect, but the constant discharge tends to debilitate, and the irritation to counteract, in some measure, the good effects of the evacuation.

During the use of blisters, or other local discharge, the internal use of medicines, which have been denominated refrigerant, may be also resort to, with some advantage; such are acids, especially the vegetable, and certain neutral facts, as crystals of tartar, nitre, &c. The last named fact has been strongly recommended by Dr. Dickson, (see Med. Obs. and Inquiries, vol. iv. p. 208,) especially where there is haemoptysis, administered in small doses frequently; "when given early in an hemorrhagie," he says, "I can almost equal-ly depend upon it, as upon the cortex peruviana in a genuine intermittent." But general experience does not warrant this encomium to its extent. We believe the digitalis to be the most efficacious medicine, in repressing that inflammatory action of the arterial systen at large, and of the pulmonary arteries in particular, which commonly goes on at the commencement of phthisis, whether accompanied by pitting of blood or not. The latter it commonly suppresses, and we have frequently seen a febrile irritation, bordering on hectic, attended with a sharp and quick pulse, a dry ringing cough, and commencing emaciation, speedily subsides under its administration. The digitalis may be given in combination with the acids, or with nitre, in a mucilaginous liquid. The cerufa acetata, or acetate of lead, was formerly employed in considerable doses, especially by the continental physicians, with the view of counteracting inflammatory action, and of suppressing haemoptysis. The medicine, it would appear, is poifoned of some efficacy; but the danger of inducing paralysis, and pulmonary and other effects, which result from the poison of lead, is sufficient to deter us from its use. Where the inflammatory action is high, we should be cautious in employing opiates, with a view to allay the cough; as, in such cases, opium in any form proves too stimulatine; but where there is languor and debility, and lefs of the fanguine temperament, and the cough extremely haraffing, opiates may be employed with benefit; they will fave the strength of the patient, by appeasing the incessant irritation of coughing, which tends to wear him down, and deprive him of sleep.

Medicine, however, will not alone secure the patient from the deleterious progress of the disease. He will be required to pay strict attention to his diet, and to every external circumstance that can influence the functions of the body. His meat and drink, his clothing, his exercise, his sleep, and even his amusements, must be regulated with a rigid correctness, so that the whole may combine, with medicine, to accomplish the fame object, that of ridding the constitution of a diæase of fatal tendency, and restoring it to its healthy condition. Diet, regimen, and medicine, must be combined in it to remove the bulcs of the patient. He must regulate his life chiefly upon this principle; that every thing which can heat or irritate the bod, or excite any increased or irregular action of the arterial systen, must be shunned; and every measure which can support the constitution, without infringing on the laft-mentioned precept, zealously adopted.

The diet of the consumptive, in the early stage, of which we now speak, should be light and nourishing, and such as is found to be adapted to his digestive powers. Animal food should
should be avoided; and vegetable matters, in the various forms of preparation, with the ripe faccharine and tub-acid fruits, and milk, be made the exclusive nourishment of the patient. Milk is particularly serviceable, as being very nutritious, and easily digestible, without stimulating the system, and should be considered as the basis of the patient's diet. In some habits, however, where the digestive powers are feeble, or where there is a peculiar idiosyncrasy, cow's milk is not readily digested; a load at the stomach, or acidity, or head-ach, ensue after it is taken. In such cases, the whey which is produced by separating the curd part, or the butter-milk which is left after the separation of the oily part, or butter, may be substituted with advantage. Or the patient may have recourse to the lighter milk of the goat or the ass, which contains a smaller proportion of those heavy parts. The acidity which milk occasions in the stomach of some people, may be occasionally corrected by the admixture of lime-water. Some of the alkaline preparations from vegetables, may be used in conformity with this plan, such as the arrow-root, tapioca, &c.; and it is scarcely necessary to add, that with these, as with all other food, wine, spirits, and fermented liquors, must be most judiciously avoided. A mucilaginous vegetable has lately been introduced, which, in feeble habits, seems calculated to assist this plan; namely, the lichen idiosyncas, which may be taken boiled in milk, and which, with its nutritive qualities, combines a very mild tonic power, which somewhat aids the digestive.

While every thing is done, by means of medicine and diet, to repress inflammatory action, while we moderately support the strength of another measure, that more efficacious, should be adopted, by those who have the power; they should remove to meet the winter in a warm and more equable climate. Cold, but especially sudden vicissitudes of cold and heat, appear to be the most irritating circumstances to a beginning consumption; and there are many living testimonies of the benefits which have been derived from an early visit to a more genial atmosphere. Portugal, the south of France, and Italy, have been attended to, as well as the more regular and moderate climates of Madeira and St. Helena. Where these climates cannot be visited, some parts of our own island may be tried, as being milder than the rest; as Devonshire, and the neighbourhood of Brixton; which latter place possesses the additional advantage of a wholesome tepid water. Influences of the indigency of all these places, are, indeed, but too numerous; but much of this is to be attributed to the patients themselves. They perish in waiting the refult of time, or of the lefs efficacious means of relief, until relief is altogether beyond their reach. "It seems too often to be the fate of consumptive patients," says Dr. Fothergill, "to do that which they ought to have done first; and, by this preposterous conduct, shorten their own lives, and afflict all who have any regard for them." (Med. Obs. and Inq. vol. v. p. 369.) The same intelligent physician affirms, that the Brixton water is, in his opinion, an efficacious medicine; and that he has "often found it of signal benefit to consumptive patients;" but "it is before the approaches to a confirmed phthisis that patients ought to repair to Brixton; otherwise, a journey thither will be, not only without benefit, but will be probably detrimental." Ibid. Those who have visited the pump-room at the hot-wells, must have seen, with pity, the hopeless condition of the poor creatures who are dragged thither, to their personal detriment, and the discredit of an useful medicine.

Exercife, by various modes of生成, has been frequently employed as a remedy for consumption. Sydenham, indeed, asserted, that riding on horseback is as efficacious in the cure of phthisis pulmonary, as the bark in ague, or mercury in the venereal disease, provided the journeys be long enough. An example is related in Dr. Darwin's "Zoology," vol. ii. (the case of the late ingenious Dr. Curnock of Liverpool,) in which an hereditary phthisis was removed, by persevering in a daily journey; at first in an easy carriage, and subsequently, as the strength increased, alternately in the carriage and on horseback. Some physicians, however, are of opinion, that exercise on horseback is more efficacious than otherwise, in phthisis. (See Dr. Dickson's paper, before quoted.) Simulating seems to be considered at present as the most efficacious mode of generation, especially if a long voyage is taken, which is a double recommendation of the removal to a warmer climate. As a sort of substitute for this kind of genial motion, swimming has been recommended as a remedy for phthisis, and Dr. Carneshead Smith has written a treatise in its favour. In the use of any, or all these modes of gentle exercife, however, the same precept must be pursued; they must be retorted to early in the disease.

If the plan, now detailed, has not been adopted in such time and mode, as to have checked the disease; if it has, therefore, advanced to the confirmed state, with prevalent expectoration, hectic fever, and profuse night sweats; the principal object of medicine becomes merely palliative, and confined to the alleviation of urgent symptoms. If the cough is exceedingly urgent, opiates may be administered more liberally than in the early stage. At this period, some of the more stimulating expectorants are employed by some practitioners, with a view to facilitate the discharge of the matter which loads the lungs; such as the oxymel, or other preparation of fopall, the various balsams, and fopall of the guaiacum. But the experience of the most observing physicians has decided against the utility of these drugs. (See Dr. Fothergill, loc. cit. Dr. Cullen, loc. cit.) There may be occasional circumstances in particular contiguities, where the objections may not exist, as in a cold phlegmatic habit, or where there is considerable debility of circulation, with little inflammatory tendency; but these are not common. The colliquative fivets and diarrhoea frequently alternate with each other, and medicines which relieve the one, are liable to increase the other. The diluted sulphuric acid has a considerable influence over the night sweats, and opium is an efficacious medicine against the colliquative diarrhoea. But the opium seems to favour the occurrence of the perspirations, and the acid tends to excite the action of the bowels. These medicines, therefore, must be combined, or used singly and alternately, according to the circumstances of the case. Opium may be also given by way of enema, when the diarrhoea is obstruente.

Some practitioners, presuming that the hectic fever, and the whole series of phthisical symptoms, were dependent on debility alone, have recommended the use of tonic medicines, and a generose diet, in the state of confirmed phthisis; and several cafes are on record, in which this plan appears to have been attended with success. (See Dr. May's Papers, Lond. Med. Journ. vol. ix. and xi.) But we have already observed, supported by the authority of Dr. Willan, that carthahl affections occasionally put on the symptoms of phthisis, and recover under the ordinary means. There are also cafes of this fort, in which there is, we believe, no ulceration, but only a purulent secretion from the membranes, which nevertheless terminate fatally, with the want symptoms of phthisis; and perhaps it is in such cafes, that a tonic treatment is actually successful. But we have
no means of distinguishing these cases from the more general instances, in which abundant experience has taught us, that all stimulating or corrodent medicines and food tend to augment the cough and expectoration, to increase the hectic fever, and therefore to accelerate the destruction of the constitution, even in the last stages.

Emetics, repeated daily, have also been recommended, as a remedy for phthisis. They afford, we believe, a temporary relief to the respiration and cough, but nothing more. On the contrary, the continued repetition of such an irritant, and such a derangement of the natural action of the stomach, necessarily tends to debilitate and impair the functions of this viscus, and to weaken the constitution at large.

Before we conclude, we cannot omit mentioning an illusion, which was fostered in the minds of some enthusiastic physicians, after the discovery of the composition of atmospheric air by the chemists. It was found that oxygen was the great stimulant of life, and the source of the salutary change of the blood, which is marked by its florid colour. From the general fluid colour of the blood of the phthisical, it was supposed that consumption was occasioned by a general hyper-oxygenation of the system; and hence, by an easy inference, the breathing of air, in which the proportion of oxygen was diminished, by the addition of some azotic air, such as carbonic acid gas, or carbonated hydrogen, was suggested as a probable remedy for consumption. Cakes were even published, illustrative of the extraordinary efficacy of this new medicine. But the light of experience has opened the eyes of the visionary, and the phantom has disappeared. It has even been shown by the experiments of the French chemists, that the admission of oxygen, or, at least, its disappearance in the lungs, is influenced principally by the rate of the body, and not by the proportion existing in the air which is inspired.

Consumption, mesenteric. See Tables mesenterica.

Consumption, in Farriery, is also a diftinct incident to horses, consisting in waste of mucus in the lungs, attended with a bloody fever. In this disorder bleeding in small quantities is recommended: mercurial purges, and a powder of native cinchona, gum guaiacum and nitre, of each one pound, in the quantity of an ounce twice a day; spring grubs, and salt marshes, are also of great service, when there is any prospect of a recovery. See Condition.

CONSUMUS. See Consulalia.

CONTA, in Geography, a river of Italy in Genoa, which runs into the sea near Albenga.

CONTACT, (from the Latin contactus,) means the meeting, or mutual touching of two things. The word is universally used in the common affairs of life, as well as in scientific subjects.

In geometry a line is said to touch another line, or a surface, or a body; and a plane figure, or surface, is said to touch another surface or a solid, when the former meets the latter; but, being produced, does not cut it. Thus amongst the definitions of the third book of Euclid's "Elements of Geometry," a right line is said to touch a circle, when meeting with the same, and being produced, it does not cut it. Also two circles are said to be in mutual contact when they meet, but do not cut each other. Thus the mathematical meaning of the word contact is clear and definite, nor can any doubt arise in the speculative mind concerning the nature of it; the abstract ideas of a line, of a surface, or of a solid, being perfect and independent of any physical qualities of a doubtful or uncertain nature.

The contact of two spherical bodies is only in one point; and the same holds of a tangent and the circumference of a circle. See TANGENT. Hence, because very few surfaces are capable of touching in all points, and the cohesion of bodies is in proportion to their contacts; these bodies will stick fast together, which are capable of the greatest contact. The contact of curve lines or surfaces, with either straight or curved ones, is only in points; and yet these points have different proportions to one another, as Mr. Robartes has shown in the Philos. Trans. vol. xxvii. p. 470; or Abr. vol. iv. p. 1.

In mechanics and in philosophy the contact between two bodies is said to take place, when one body, being brought near another body, cannot be approached nearer to it without, in some measure, affecting its state, be it of motion or of rest. Thus a stone, being gradually moved towards another stone, is said to come in contact with it, when its progress is either absolutely, or partially, obstructed by that other stone. Or, if they be both at rest, and contiguous to each other, they are said to be in contact, when one stone cannot be moved towards the other, without either urging the other forward, or being stopped by it, or lying without making an impression upon its surface. The same thing must be understood of the contact between any other bodies. But the great question in philosophy is, to determine whether the bodies which thus hinder, or affect, each other's state of rest or motion, do actually come in contact with each other's surface in the strict mathematical sense, or they exact that hindrance, opposition, reflexion, &c. in virtue of a repulsive power, which acts at a certain indefinite small distance from their surfaces. This question seems, at first sight, to be easily determined; but, when duly considered, it will be found to involve certain properties of matter in general, and certain effects, which, in the present state of knowledge, are far from being thoroughly understood, or sufficiently examined.—The reasons which suggested the above-mentioned doubts, concerning the contact of bodies, and the answers which may be offered in elucidation of the subject, being fully deserving of notice, we shall now endeavour to relate them in a regular and copious manner.

Sir I. Newton, having placed a glass lens of a figure slightly convex, upon the flat surface of another glass, and having pressed the one against the other, observed certain coloured rings formed between the two glasses, and concentric with the point of contact in the middle of the glasses, which point was marked by a colourless dark spot. He further observed, that those rings of prismatic colours, and the dark central spot, became larger when the glasses were pressed harder against each other, and became diminished in size when the pressure was diminished.—From the known figure of the glasses employed in this experiment, it is evident that a certain space or a film of air must remain between their contiguous surfaces; that this space, or film of air, became thinner when the glasses were pressed hard against each other, and vice versa; lastly, that at the centre, where the glasses may be presumed to have been in real contact, the want of space, or of air, rendered that spot colourless. In this experiment it is supposed, that the colours are owing to the space or film of air between the glasses; hence the central spot exhibits no tinction; and therefore, that when any prismatic colours appear between the contiguous surfaces of two glasses, their contact cannot be perfect. Nearly the same thing is observed when two flat pieces of glass are pressed against each other; prismatic colours being likewise seen between them, though not in rings, but in rows, which assume various directions, according as the pressure may happen to alter the surfaces of the glasses. And these colours cannot be made to disappear without the application of...
of an enormous degree of pressure; hence it is inferred, that, though of two bodies one may support the other, or push it forward, yet their contact may not be perfect. Professor Robison reckons the force with which two pieces of glass must be pressed against each other, in order to produce a perfect contact, as equivalent to the pressure of 10,000 pounds for every square inch of surface; so that if two pieces of glass strike against each other, without exerting a pressure equal to 10,000 pounds per square inch of surface, they may affect each other's motion, and yet not come actually in contact. In consequence of the above facts and observations it is supposed, that a repulsive power exists on the surfaces of bodies, and that this power is extended to a very small and inappreciable distance beyond the surface.

Another argument to prove the existence of the above-mentioned repelling power on the surfaces of bodies, is derived from the phenomena exhibited in an electrical experiment. When an electric jar is discharged through a metallic chain in a darkened room, sparks of electric light are visible between the contiguous surfaces of the links. Dr. Priestley, considering this effect as arising from the want of perfect contact between the links, endeavoured to render it perfect by stretching the chain, until on making the discharge no such sparks should be seen. This he accomplished by making one end of the chain fast on a firm body, and appending weights to the other end. Thus proceeding, he found that a very considerable weight was necessary to be applied, before the sparks could be made to disappear between the links, when the jar was discharged through the chain. This induced Dr. Priestley to conclude, that the links of the chain could not be brought into actual contact without the application of a great force; since the electric sparks are visible only when the electric fluid in passing through a body or a series of contiguous bodies, meets with some obstruction, or interruption of continuity.

Besides the existence of the above-mentioned repelling or repulsive power on the surfaces of such gross bodies as come under the cognizance of our senses; it is farther supposed, that each component particle of such bodies is indued with the same repulsive power; in consequence of which they are not actually in contact with each other, though they form the same firm and impenetrable compound. And the existence of this power has been inferred from the phenomena of contraction and expansion. "Whatever opinion," says Dr. Young, "we may entertain, with respect to the ultimate impenetrability of matter in this sense, it is probable that the particles of matter are absolutely impenetrable to each other. This impenetrability is not however commonly called into effect, in cases of apparent contact. If the particles of matter confining water, and steam, or any other gas, are of the same nature, those of the gas cannot be in perfect contact; and when water is contracted by the effect of cold, or when two fluids have their joint bulk diminished by mixture, as in the case of alcohol, or sulphuric acid, and water, the particles cannot have been in absolute contact before, although they would have reflected with great force any attempt to compact them. Metals too, of all kinds, which have been melted, become permanently more dense when they are hammered and laminated."

Whatever wish to form a proper estimate of the merits of the above-mentioned arguments, and of the validity of the proposition which they are intended to establish, must necessarily take into the account all the other properties of matter, which have been discovered and confirmed by repeated and universal experience; for, should it appear impracticable to reconcile the former with the latter, then such other explanation of the phenomena ought to be substituted as may be attended with less contradiction and greater simplicity.—That there is a mutual and universal attraction amongst all the particles of matter, is now no longer to be doubted; that this attraction is extended to all distances under certain determinate laws, has been sufficiently established by strict mathematical reasoning upon the grand phenomena of the world; that the surfaces of several bodies, like those of polished glass or metallic bodies, when placed contiguous to each other, manifest a considerable degree of attraction, is well known; and, lastly, that the component parts of bodies cannot be separated without a considerable force, is shown by daily and common experience. Yet, notwithstanding all these evidence of attraction between the bodies of the universe at all distances, we are told that a considerable repulsive power exists on the surfaces of bodies, and even that every individual particle of matter is endowed with a similar power; so that in the hardened bodies, such as a diamond, a flint, a piece of metal, &c. which cannot be divided without an immense force, the component particles are not actually in contact with each other. But let us endeavour to explain the phenomena, upon which the above theory is established, in a simpler and more satisfactory manner.

In the experiments with the glass, it is said that their actual contact is prevented by a power of repulsion on their surfaces, which cannot be overcome without a very extraordinary pressure. Would it not be more natural to suppose, that the contact cannot be easily effected on account of the inequalities of the surfaces, and of the hardness of glass? The surface of the glass may be said to be slightly convex or perfectly flat, and such as may appear to be for common purposes. But if a person examines how the surfaces are formed and polished; if he considers the alterations of figure which are unavoidable occasioned by the partial dilations or contractions arising from heat; and the difference of the former and latter, in the interposition of the flat particle of glass, on the surfaces of the air itself: he will be easily persuaded, that these facts are by no means really flat or uniformly convex in the strict meaning of these words. It is true that the action of those causes, as the inequalities that are produced by them, are exceedingly small; but it is of small effects that we are speaking. Upon the whole, therefore, it seems, that when the flat and convex glasses in the Newtonian experiment, or the two flat glasses, are placed one upon the other, they do not actually touch each other, but in a few points only, and with their more prominent parts, and that the other more depressed parts of their surfaces cannot come into actual contact, until the former are depressed to the level of the latter, by the application of an external force; so that the application of this force is not required by the existence of a repulsive power, but by the necessity of depriving the more elevated parts, in order that the lower or hollow parts may come sufficiently near to each other. This idea seems to derive additional confirmation from the degree of pressure which must be applied, &c. being, at least apparently, proportional to the hardness of the bodies employed. Thus, in glass, which has a great degree of hardness and rigidity, a considerable pressure must be applied for the purpose. Bring two pieces of cold wax close to each other, and the one will pull the other forward without adhering to it, because in that cold state the contact can take place in a very few points only; but if those pieces of wax be prolonged by heat, it will be found, that one of them cannot be caused to pull the other without adhering to it, because in that state their surfaces are easily adapted to each other, and instantly increase the number of points of contact.

The appearance of sparks between the links of a metallic chain, when an electric jar is discharged through it, may be explained...
explained in a similar manner, without having recourse to a
power of repulsion, &c. for, in consequence of their figure,
and of the inequalities of surface, the links cannot touch
each other in more than a very few points, through which
the electric fluid must pass; and though in those points the
contact be perfect, yet the electric fluid either melts them or
renders them red-hot, and of course affords the appearance
of luminous sparks, in the same manner, and for the same
reason, which renders a very fine metallic wire red-hot, or
fuses it, when an electric jar is discharged through it; namely,
because it is not large enough to afford a free passage
between the electric fluid. So that if in the slender wire, where
there is no interruption of continuity, the passage of the elec-
tric power is rendered manifest to our eyes, it may be evi-
dently premised that the sparks may appear between the
links of the chain, though those links may be in actual con-
tact. That the light disappears when, by stretching the
chain, the points of contact are multiplied, needs no farther
explanation. But the circumstance which contributes to the
production of the sparks, is the adhesion of dirt or dust, or
the partial oxidation of the surface of the links; considering
that chains for electrical purposes are generally made of brass
or iron, which are very liable to a superficial oxidation.

With respect to the last argument, derived from the con-
traction and dilatation of bodies, we may observe, with
professor Prevost, that the diminution of bulk does by no means
prove that the component particles of bodies are not in im-
mediate contact; for a person may easily conceive an infinite
variety of arrangements or dispositions of the elementary
particles, which will admit of contraction and dilatation, with-
out the least interruption of contact. Those particles, for
instance, may be disposed in the form of rings which, by
becoming more extended ovals, or more circular, will occa-
sion an enlargement, or a contraction of the aggregate. The
particles may be supposed to be arranged in rows, and these
rows may be disposed at certain angles with each other; so
that the bulk of the aggregate may become expanded or con-
tracted according as those angles are enlarged or diminished;
and so forth. That some such arrangement is not only pro-
bable, but does actually take place in most bodies (whence
it may be inferred to take place in all bodies) is clearly indi-
cated by the crystallization of several bodies; viz. a regular
arrangement of their particles; as in zinc, bismuth, frozen
water, salts, &c.

Contact, angle of, is the angle HLM (Plate III.
Geometry, fig. 51.) formed by the arc of a circle M L, with
the tangent H L, at the point of the contact.

Euclid demonstrates, that the right line H L, standing
perpendicular on the radius C L, touches the circle only
in one point: nor can there be any other right line drawn
between the tangent and the circle.

Hence, the angle of contact is less than any rectilinear
one; and the angle of the semicircle between the radius
CL, and the arc ML, is greater than any rectilinear acute
angle.

This seeming paradox of Euclid has exercised the wits of
mathematicians: it was the subject of a long controversy be-
 tween Peletarius and Clavius; the first of whom maintained
the angle of contact heterogeneous to a rectilinear one; as
a line is heterogeneous to a surface: the latter maintained
the contrary.

Dr. Wallis has a formal treatise on the angle of contact,
and of the semicircle; where with other great mathe-
ematicians, he approves of the opinion of Peletarius. See
Angle of Contact.

CONTAGION, frequently used as synonymous with
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The contagion, by which these fevers are propagated, is generated in three ways:—by the confinement of the healthy animal exhalations or effluvia in a crowded, and ill ventilated place;—still more readily by the confinement of morbid effluvia, although the disease be not originally contagious; and glibly, by the exhalations from putrifying dead animal matter.

1. Many facts have been recorded, which shew that the natural effluvia of the living body, become the source of contagious fevers, when accumulated and concentrated in close apartments. Mr. Howel and others, who escaped, from the black hole of Calcutta, were feized with typhus fever. Dr. Lind informs us, that in a frigate, which failed from North America, with a healthy crew, a malignant fever broke out before her arrival in England, during very bad weather, which affected a considerable number of the men, and of which the Surgeon's mate, boatwain, and some others died. "Thus," he remarks, "a seafomed found crew became infected, as it would appear, from the clovenfe or damp below, occasioned by the hatchway being kept flutt." (On Fevers and Infections, chap. i. § 2.) Sir John Pringle has observed that the hospitals of an army, not only when crowded with sick, but at any time when they are crowded, and especially in hot weather, produce a fever of a particular kind, and often mortal. "I have observed the same fort to arise," he adds, "in full and crowded barracks, and in transport-ships when filled beyond a due number, and detained long by contrary winds; or when the men have been long kept at sea under close hatches in stormy weather. Hospital-ships, for distant expeditions, have for this reason been generally destructive both to the sick and their attendants. (Obf. on the Dif. of the Army, part iii. chap. 7.) But contagious fevers are much more readily produced, under circumstances of confinement, where uncleancines has also conspired: hence such fevers originate most frequently among the poor, and even the most fevere pestilence, when not imported, is generally to be traced to some quarter chiefly inhabited by the poor.

2. Where people, labouring under any diseases, are crowded together, more especially if the apartments are imperfectly ventilated, contagion is readily generated. Sir John Pringle remarks, that contagious fever "is incidental to every place, ill aired and kept dirty, that is filled with animal exhalations from foul and diseased bodies; and on this account, jails and military hospitals are most exposed to this kind of pestilential infection: as the first are in a constant state of impurity, and the latter are so much filled with the poisonous effluvia of sores, mortifications, dyseretic and other putrid excretions: nay, there is reason to apprehend that when a single person is taken ill of any putrid disease, such as the small-pox, dyseretic, or the like, and lies in a small close apartment, he may fall into this malignant fever." Loc. Citat. It is very common, indeed, to observe mild febrile attacks among the poor, which, though originating from cold or other causes, become contagious in their course, in consequence of the confined and dirty situations in which the patients live.

3. Contagion occasionally originates from the putrifying effluvia of animal and vegetable matters. Thus it often happens that typhus fever spreads itself over the adjacent country, when the dead are left unburied on the field of battle. Forelos mentions a contagious fever, which raged at Egmont, in North Holland, occasioned by the putrefaction of a whale, which had been left on the shore. And Senec gives an account of a malignant fever, excited by the offal of a city being accumulated without the walls. It was received.
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received into a ditch filled with water, and, while it was covered with the water, was not attended with any bad consequence; but when the quantity increased, so that it rose above the surface, a dreadful fever spread through the city, and its neighbourhood; so that, where four hundred used to die yearly, the deaths were incaresed to two thousand. Willon on Febrile Diseases, loc. cit.

The most important part of our inquiry respecting contagion, relates to the mode and circumstances of its communication from individual to individual, and of its general spreading, with a view to discover the means of suppupling it, or preventing its extension. This inquiry is, of course, limited to the contagions which are tangible or diffusible in atmospheric air; since it is obvious that the indiffusible contagious may be avoided, by shunning the contact of the diseased. And it must be premised, that all the visible contaminations, whether of a specific origin, as that of small-pox, measles, scarlet fever, or malignant sore throat, or arising from the usual change of the animal cibation, jaundice, and hospital fever, and perhaps the plague, have been found, by experiments, to be propagated according to the same laws, and to be suppressed by similar means.

Whenever a contagious epidemic disease prevails, a great general alarm is excited, in consequence of a notion, that the seeds of an evil so generally destructive must be diffused through the atmosphere at large; and that, if we flir abroad, we breathe contagion at every step. This opinion has been promulgated by physicians of high rank and authority; but recent observations have shewn that it is erroneous: thus at once removing all grounds for this unnecessary alarm, and directing our attention to those means of precaution and prevention, which can alone effectually contribute to our security.

Dr. Lind long ago affirmed, after an extensive experience in the great naval hospital at Halfor, that the infection of malignant fever, in common with that of the plague, "extends to no great distance from its source."—"In the open field," he adds, "this infection does not appear to diffuse itself above fifty or sixty feet from its source." Chap. iv. sect. 2.

With respect to the plague, it has been well ascertained by physicians, that its contagion does not contaminate the atmosphere in general, nor indeed to any great distance from the source of the poison. Dr. Patrick Ruffeli, who was in extensive practice at Aleppo for many years, particularly during the plague of 1760, 1761, and 1762, used to administer medicines to great numbers ill of the plague, every day, out of a direct window, about 15 feet above the ground, even in June and July; and, being short-sighted, he examined the forems within four feet; yet neither his family, nor any inhabitant of the square where he lived, were infected by the contagion of such a number of pestilential patients: and he affirms that it never spread in a large house, if communication were prevented. A numerous body of Franks live in Constantinople, and are uniformly deprived from the plague, by observing a few rules of cleanliness and separation, while the Turks die of it in multitudes around them. Dr. Martens, author of a history of the plague at Moscow, anno 1771, has shewn that the contagion was disseminated to a very short distance through the air: a fact, which was demonstrated by the successful conduct of the committee of physicians, appointed by the empehrs to attend the sick on that occasion. The just inference from these observations is, that the plague is principally propagated by actual contact or clore communication with the diseased, or their clothes, furniture, &c. "Solo agrorum et rerum infec-

In addition to such facts, which are flaeted by physicians of high respectability, we have the support of direct experiments, made respecting a contagion not less virulent and fatal than the plague itself, viz. that of the small-pox; by which the short distance, to which the poison is communicated through the air, is demonstrably proved.

Dr. O'Ryan, professor of physic in the college at Lyons, instituted the following experiments, which we shall relate in the words of Dr. Haygarth's translation: "I placed a large doll of cotton, foaked in various matter, on the needle of an oval table, whose leaf diameter was three feet. I fenced six children around it, three on each side of the table, in such a manner that all were situated within half a yard of the infectious cotton. This experiment was sometimes made in the open air, sometimes in the house. I took care to renew, every second day, both the various matter, and the inhabitation which contained it. I alternately used the poison taken from the inoculated and from the casual small-pox; and I copiously impregnated with it balls of cotton, wool, and silk. This operation, repeated during a whole week, morning, noon, and night, for an hour at each sitting, produced no effect.

I then sent away the children, delivering the parents to acquaint me, in case any indisposition appeared, and to bring them to me a fortnight afterwards, although no alteration should have taken place in their health. I declare that not only for that term, but for many succeeding months, during which I took care frequently to visit them, they all enjoyed perfect health. It was not till nine months after this time, that four of these children had a mild kind of small-pox.

Having concluded from these experiments, that the children could not have escaped infection, but because the various matter might have lost that fpring and that degree of energy, which perhaps it may possess on arising immediately from the human body, I placed a person, in the eruptive fever of the small-pox by inoculation, at the distance of about half a yard from four children properly prepared: each exposure continued one hour, and was repeated daily for a fortnight, reckoning from the commencement of the fever till the pustules were become perfectly dry. Not one of the four received the infection. Two months afterwards, I inoculated three of these children: they had the distemper in a very mild manner, and recovered without difficulty." Diff. feur les Fievres Infetdeues et Contagieuses. See Dr. Haygarth's Sketch of a Plan to exterminate Small Pox, vol. i. p. 79.

Again, proofs that the sphere of activity of fbrile contagion is extremely limited in the air, have been greatly multiplied since the institution of feverwards and houses of recovery, which were fuggestled by Dr. Haygarth, from the contemplation of such facts as we have just detailed. The feverwards, in the Chelsea Infirmary, are situated within thirteen yards of some other wards of the building; yet, during a space of above twelve years, the contagion of fever was never known to extend itself from thence. And Dr. Currie relates, in a letter to Dr. Clark of Newcastle, that contagious fever had not, during ten years, extended itself, in any one instance, from the fever-wards, either in the Liverpool Infirmary or in the workhouse, although the latter of these buildings has sometimes contained 3,400 persons.
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In like manner, the house of recovery, in Gray's Inn Lane, London, which stands in a row, in contact with dwelling-houses on both sides, and which has had a constant succession of contagious fevers in its wards, has now (Dec. 1807) been open nearly six years, and no fever has occurred in its neighbourhood during the whole period. Nay, it has been farther ascertained, in these wards and houses, as well as in the habitations of the rich, that, in a clean well- aired room of a moderate size, the contagious poison is so completely disarmed of its virulence, by dilution with fresh air, as rarely to excite the distemper, even in nurses, exposed to all the putrid malaises of the breath, perpiration, and other discharges. See Dr. Haygarth's Letter to Dr. Percival, on the Prevention of Infectious Fevers, 1801. Dr. Clark's Collection of Papers respecting Fever-wards, Newcastle, 1802. Reports of the Institutions for the Suppression of Contagious Fever, in Dublin, London, Manchester, &c.

A sufficient number of facts, we truly, has been cited, to show that the popular opinion and apprehension are groundless, and that the most malignant contagious are never conveyed to any great distance through the atmosphere; but that they are, in fact, rendered inert and harmless, by dilution in the open air, and even in the air of a well-ventilated apartment. The necessary inference is, that all pellagra is propagated by near approach, or actual contact of, the infected, or by the conveyance of the contagious poison in articles impregnated with it.

Dr. Lind remarks, in the effay before quoted, "by a fixed attention to this subject for some years past, I am convinced, that the body of the diseased, kept exactly neat and clean, is not so liable to impress the taint, as his late wearing apparel, dirty linen, and uncleanliness of any sort about him, long retained in that impure state:—I say, these will contain a more certain, a more concentrated, and contagious poison, than the newly emitted effluvia or excretions from the sick." There is no doubt that such fomites spread and perpetuate many contagious diseases among us. It is ascertained that cotton, hair, and wool, are the substances most readily imbued with contagion, which becomes more virulent, when the air is prevented from having free access to them. If infected clothing, made of these materials, remain for some weeks in a full close room, or locked up in chests, and be then folded out during an unhealthy season, not only the wearers of it, but all who have intercourse with them, are presently affected, and contribute to spread the diseased. Thus the Europeans, says Dr. Lind, have carried the small-pox to almost all parts of the world, where their ships have opened a trade; though the feamen in those ships might not have been infected with it in their voyage. This poison has been conveyed, in an old blanket, to nations of Indians, some of whom it has almost extirpated. In the year 1746, while the French squadron, under the command of the due de D'Anville, passed the summer at Cheltenham, now Haltiax, an infectious fever prevailed among them, and cut off a great number of their men. On the return of the squadron to Europe, several blankets and old clothes, which had been used in their tents and hospital, were unfortunately left behind. These fatal receptacles of disease were soon after eagerly picked up by a party of Mimack Indians, who accidentally came to visit the place, who clothed themselves with some of them, others they carried home, and distributed among their tribe. The unhappy consequence of which was the almost total extirpation of the Mimack nation; few of whom survived. The English, upon traversing the country next summer from Annapolis Royal, were surprised with finding the dead bodies and skeletons of whole families lying unabraded in their huts, until the neutrals, who also inhabited that country, and the neighbouring In* dians informed them, that the Mimack had been cut off by the French blankets. In several of their huts, these blankets were found, where not one of the family remained. (Lind. chap. iv. sect. 2.)

Dr. Willan remarks, on the subject of fomites, that the houses of the poor in London are often so little taken care of, that in the apartments where contagious fevers have existed, enough of the contagion remains, to infect all the inmates who successively occupy the same premises; and he mentions some particular houses, in which the fomites of fever were thus preferred for a series of years. (Reports on Diff. of London, p. 256.) The same accurate observer states, that the scarlet fever, which, when epidemic, has often commenced in the easterly extremity of London, and spread westward, though it may have been sometimes imported with infected goods brought from abroad, will be more frequently found to have originated from the large repositories of old clothes, near the Tower, Earl Smithfield, and Ratcliffe Highway. "During the last year of my attendance at the Public Dispensary," Dr. Willan adds, "I had reason to think that a family in Wild-lane, Lincolns-inns-fields, was infected with Carllatina maligna by clothes bought in Monmouth-lane. More than fifty persons in the adjoining houses were soon affected with the disease, which afterwards travelled Drury-lane, and spread by Long Acre, and the streets connected with it, through several parishes in Welflimer." (On Cutan. Difeases, p. 301.) Thus also, and not by the impregnation of the atmosphere, the small-pox, measles, typhus, whooping-cough, itch, tinea capitis, &c. are perpetuated among us; and the febrile contagions are from time to time widely diffused.

A great number of facts are on record, which serve to show the extreme virulence of contagious poisons, which have been pent up and accumulated in close places, and have contaminated articles of clothing under such circumstances. In those periods of our history, when a few enlightened humanity was careless of the health of criminals, and prisoners in general, the occurrence of what were called black affizes was frequent in different parts of the country. The criminals, brought out of filthy and infected cells, with their clothes fully imbued with fomites, often spread a mortal contagion through the court, assemblage for the purposes of justice. "The most pernicious infection next to the plague," says Lord Bacon, "is the smell of the jail, where the prisoners have been long, and close, and naughtly kept, whereof we had in our time experience, twice or thrice, when both the judges, who sat upon the guilt, and numbers of those who attended the business, sickened upon it and died." One of the infallacies, to which Lord Bacon alludes, was doublets at the fatal affizes, held at Oxford, in the year 1577, at which Stow gives the following account in his Chronicle. "On the 4th, 5th, and 6th days of July, were the affizes held at OXon, where was arraigned and condemned Rowland Jenkins for a lecherous tongue; at which time, there broke amongst the people such a damm," (an expression in the language of those days, signifying bad air) "that almost all were smothered, very few escape that were not taken, here died in Oxon 300 persons, and sickened there, but died in other places, 200 and odd." Similar infections took place at the black affizes at Taunton, and also at those of Exeter, in 1569; at which last some Portuguese sailors spread the contagion, having been confided, without change of clothes, "in a deep pit and dark dungeon." The last black affizes at the Old Bailey were held so late as the year 1750. On the 14th of May the prisoners, who were brought into court, some of them labouring under small pox, had been kept more...
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nearly a whole day in small, close, and crowded apartments. All the individuals, who were seated in the course of a draught of air, passing from the prisoners to an open window, were seized with the distemper: the rest escaped. The lord mayor and those of the bench who sat on his left hand were infected; while the lord chief justice, and the recorder, who sat on his right, escaped. Many of the Middlesex jury, on the left side of the court, died of it, while the London jury, who sat opposite to them, received no injury. On the 13th of May died alderman Lambert; on the 14th R. Cox, under-sheriff; on the 15th baron Clark; on the 19th T. Abney, justice of Common Pleas; T. Otway, barrister; W. Bare, ditto; W. Sharples, and four others; on the 20th, the mayor and eight of the Middlesex jury. See Gentleman's Magazine.

These facts, while they evince the active virulence of contagion, accumulated in fumites in unventilated and crowded rooms, afford, at the same time, evidence, that, except where it is carried at once by a direct draught of air, its tendency to diffuse itself, and its power when diffused, through the atmosphere in general, is very limited. It is only under such circumstances of concentration, that the virulence of contagion is ever so great, as to be infectious at more than a few feet distance. It has already been seen, that when arising from the body of the sick, either in the open air, or in well ventilated rooms, its influence is confined to a very small distance.

Before we point out the means of prevention from contagious diseases, which these facts and observations suggest, it will be necessary to attend more particularly to the circumstances of individual infection.

All individuals are not equally liable to be infected by contagion; and some, though the number is extremely small, escape altogether. Thus, there are persons who have gone through a long life without taking the small-pox. The constitution, however, appears occasionally to undergo such a change, in the course of life, that those who, in earlier years, had resisted the action of this contagion, have received it on some future occasion to its influence. There is a considerable difference, too, in the infectious degree of different contagions: thus, that of the whooping-cough affects a much smaller proportion of mankind, than that of the measles, or small-pox; and that of the scarlet fever excites the disease in children much more frequently than in adult persons. Again, the contagion, in some instances of pestilence, and, we believe, in the plague in general, is more fatal to the vigorous and middle-aged, than to the old on the one hand, or to children on the other. We were informed by a gentleman, who resided at Malaga, during the late pestilence at that place, that the appearance of the town, after the effusion of the fever, was remarkable, in consequence of the small number of strong, active, and well-looking people, who were to be seen; old people and children constituting almost the whole of the remaining population. In the typhus, or contagious malignant fever of this country, Dr. Haygarth infers, from accurate deduction, that about one in 150 escapes infection, though fully exposed to the contagion; which is less than one in twenty-four. (See Letter to Dr. Percival, p. 31.) It has been calculated that nearly the same number, or one in 25, is naturally exempted from the contagion of the small-pox. Upon this datum it was also calculated, that if two persons together have escaped the disease, the probability, that they were never both exposed to an infectious quantity of the poison, is above 400 to one; if three in a family have escaped, above 8000 to one. (Haygarth's Inquiry how to prevent the Small-pox, p. 24.) This mode of reasoning is equally applicable to typhus infection.

Now, as great numbers of people, visitors, nurses, &c., breathe the air of the chambers of patients, ill of contagions fever, and yet escapes infection, it is obvious that in almost all these cases, (at least in 22 out of 25) a sufficient dose of the poison had not been received. This leads us to an important inquiry, into the dose of typhous contagion requisite to produce infection. The quantity will vary, no doubt, according to different circumstances, but the observations of Dr. Haygarth, and of the physicians of fever-wards, and houses of recovery, have enabled us to judge with some accuracy of the limits of this variation. There appears to be a direct analogy between contagious miasmas and other poisons. The larger the dose of a poison or drug, the greater in general is the effect which it produces. Many of the most powerful and salutary medicines, when taken in too large a quantity, are poisons, as opium, antimony, mercury, fennel, thallium, &c. And, on the other hand, even arlene itself, the most virulent and unmanageable of the contagions, has, by the skill and attendance of physicians, been reclaimed from the class of miasmic substances, and by a diminution of the dose is judiciously held to be a safe and useful remedy. Further, in different constitutions, and in different maladies, there is a certain degree of variability in the operation of any drug. Thus four or six times the dose, e.g. of antimony or mercury, may be required for one patient more than for another, or for the same person in different diseases. In the same way the miasmic quantity of infectious miasmas admits of some variation.

It is clear, from the collected observations of Dr. Haygarth, and of those active and experienced physicians whose correspondence he has published, not to mention the experiences which fever-wards have lately afforded, that in a large, airy, and clean apartment, few or none even of the most intimate attendants catch the disease, where the patient labours under infectious fever. The nursey themselves, exposed to the effluvia of the excreta, and perpetually near, and often in contact with the sick, nevertheless hardly ever receive infection. The atmosphere of a room of these con-
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upon this point to an indefinite extent, but the general safety of medical men under such circumstances is sufficient to prove, that air strongly impregnated with infectious miasms may be breathed for a short time, and air weekly impregnated for a long time, without any injury. We might, hence be almost led to believe, that the poisonous miasms do not generate a fever, till they have been respired without interruption, for several days together; and it is not improbable that, in some persons, such an accumulated quantity of the poison may be required.

There are, however, other facts which prove that this is by no means always the case. Infection is occasioned suddenly, in some instances, and from a very short exposure to a petilential air. Whether this is owing to peculiar susceptibility of the individual, or to the particular mode of receiving the contagious effluvia, is doubtful. The writer of this article, about six years ago, visited a poor family, of four persons, lying in the same bed, in an exceedingly close and dirty apartment, ill of contagious fever. He always had the precaution to throw open the window on entering the room, to flatten himself between the window and the bed, whilst he examined the sick, and to remain but a short time with them. He had relaxed his daily visits during a week, and with impunity, when for a short period of time he was attended by another physician, who designed to admit the patients into the House of Recovery, just then opened in Gray's-inn-lane. The latter took no precaution, but examined the skin of the sick minutely and closely, standing on that side of the bed towards which the air from the window impelled the contagious effluvia, and so near as to receive these effluvia and the breath in the most concentrated state. He took the infection, and his fever proved fatal. Here the infection of this excellent physician was attributable only to the full dose of the poison, which his incautious zeal induced him to inhale. In most cases, as in this, where a sudden infection takes place, a disagreeable fenation is excited at the moment of exposure, which different persons have described differently. Some have felt a sharp taste in the mouth, as if blue vitriol were dissolving in it, but which no washing or gargling could remove. Others have compared the first impression to that of an earthy exhalation from a newly-opened grave; the fenation extending down to the stomata, sometimes exciting innumerable tickness and stinging. Dr. Haygarth mentions that two of his patients, for whose recovery physicians, were infected suddenly by a short exposure. One of them thought that he caught the fever by creeping behind, in order to assist his patient; the other by inspecting morbid feaces. In both these cases, the exposure was such as might probably afford a full dose of the contagion. Dr. Lind is of opinion, that, in these diseases, the fumes, especially if very fæcid, are most communicative of contagion; next to these the breath; and lastly the effluvia from the body.

The activity of contagion is not always proportionate to the appearances of malignity in the diseased. Sometimes only one man in a ship may be fezzed with the pecatellar or with the yellow fever, says Dr. Lind, while all the rest continue unaffected. And the most malignant case of fever, that we ever witnessed, did not infect any of the family, though in a close and small house. And on the contrary, we have seen fevers, of the mildest description, which spread extensively: so that we fully coincide with Dr. Lind in his observation, that "fevers have often no peculiar characteristical symptom, by which they are known to be infectious," and again, when he says, "in some this fever will be more severe, in others more mild, and often most of the sick will be able to fit up through great part of the day, which cannot be urged as an argument against the infection, but only as a proof of its mildness." (Loc. cit. § v.) It is obvious, therefore, that great caution should be used in pronouncing fevers not infectious.

The period at which different fevers begin and cease to generate contagious effluvia is not absolutely ascertained. It seems most probable that in eruptive fevers there is no contagion till the eruption appears; and that contagion remains so long as any scab remains on the skin. This is clearly the case in small-pox.

The latent period of contagion, as Dr. Haygarth terms it, or the period which elapses between the exposure to contagion and the first appearance of the disease which ensues, is ascertained with tolerable accuracy in respect to the small-pox; but in typhous cases it appears to be extremely irregular. The small-pox from inoculation usually commences on the eighth or ninth day after the operation. Thus, of 810 inoculated cases, in 519 fever commenced before the ninth, and 291 on or after the ninth day. But from the testimony of Dr. Woodville, Clark, and Currie, the eruptive fever sometimes commences so early as the fifth day after inoculation; and three cases are related by Dr. Clark where it commenced so late as the 16th, 17th, and 25th day. The period in the usual small-pox is somewhat longer than in the inoculated; most commonly from 10 to 16 days. (See Haygarth, Sketch, &c. before quoted.) The latent period of the contagion of measles is from 10 to 14 days. (Willan on Cutaneous Dis.) But the latent period of typhous infection is much more irregular, and often much longer. Of a large number of cases listed by Dr. Haygarth, more than half commenced between the 17th and 33d day after exposure, a great proportion after the 27th, and almost all between the 20th and 60th. (See Letter to Dr. Percival, p. 20, et seq.) The fever occurred in only five instances before the 10th day. So that on the whole, it appears, that the latent period of typhous infection varies from a few days to two months. (Ibid. p. 68.)

This latent infection is probably often allowed to lie long dormant, or is excited into action at an earlier period, according to the occurrence or non-occurrence of circumstances which may render the constitution less capable of resisting its action. Thus persons who had some time previously been exposed to the influence of contagion, have been immediately seized, if put upon being wet with rain, or on exposure to cold and damp air, or after a debauch, or other such debilitating causes. During the prevalence of a pestilence, it has been observed that exposure to the damps of evening, especially in warm countries, is extremely dangerous. And Dr. Chisholm remarks, that those who were addicted to the abuse of intoxicating liquors, were most subject to the fever of Grenada. From the great length of time, indeed, which the contagion of fever often lies dormant, we may infer, with Dr. Lind, that it is probable, that, without the influence of those casual exciting causes, the contagion might never, in such instances, have affected the constitution.

Prevention of infection. The circumstances under which contagion is generated, and the modes in which it is conveyed and propagated, being understood, the means of preventing its production, and of avoiding its pernicious influence, when it exists, will readily suggest themselves. Instead of omitting all attempts at avoiding the contagion of a pestilence, as altogether fruitless, where the very pabulum of life, the common air, is charged with poisons; or of adopting the dangerous expedient of closing up every avenue of ventilation in our houses (Wilson on Fevers, p. 45, vol. 1), or of employing ufleks and absurd measures of precaution, we shall
shall proceed upon rational grounds to the use of effectual preventives. All those who contend that the spreading of contagion depends on some peculiar state of the atmosphere, admit that it is some occult quality in the air; that it is neither the heat nor the cold, the moisture nor the dryness, nor any other sensible condition of it, with which pejvulence is connected. The great Sydenham, after having noted attentively the state of the atmosphere and the weather, in different years, during which epidemics of different kinds prevailed, was obliged to confess that he could perceive no difference in seascans in which different contagions disfigured occurred. He, therefore, had recourse to a supposition equally gratuitous, that some unknown exhalations from the earth were the source of pernicious diseases.

But when it is considered, that contagion originates in accumulated and confined animal cilia, and is communicated either to those who approach, or come in contact with the sick, or by means of substances impregnated with contagious matter, and that, by these ways only, the means of prevention are obvious.

With respect to the casual origin of contagion, it is scarcely necessary to say, that cleanliness and ventilation, as they preclude the confinement and accumulation of the animal cilia, and secretions, will infallibly prevent the generation of the poison.

Where contagion exists, its farther communication may be prevented by avoiding contact or approach to the sick, and by confining the patient to a separate room, in which, if it be kept clean, and well ventilated, it has already been shewn, that the contagion will be inert, at a short distance from the sick; and therefore that the necessary attendants, and medical visitors, will receive no injury from respiring the air within it. In this way contagion has been prevented from spreading in large schools, and other places, where a number of people live together, as in workhouses and hospitals, of which some examples have been already given. Dr. Haygarth's rules for the prevention of infection, seem to comprise all the requisite means to be adopted, in houses where contagious fever exists; they are the following.

Rules to prevent infection.

1. As safety from danger entirely depends upon cleanliness and free air, the chamber-door of a patient, ill of an infectious fever, especially in the habitations of the poor, should never be shut; a window in it ought to be generally open during the day, and frequently in the night. Such regulations would be highly useful both to the patient and nurses; but are particularly important previous to the arrival of any visitor.

2. The bed curtains should never be drawn close round the patient; but only on the side next the light, so as to shade the face.

3. Dirty clothes, utensils, &c. should be frequently changed, immediately immersed in cold water, and washed clean when taken out of it.

4. All discharges from the patient should be instantly removed. The floor near the patient's bed ought to be rubbed clean every day with a wet mop or cloth.

5. The air in a sick room, has, at the same time, a more infectious quality in some parts of it, than in others. Visitors and attendants should avoid the current of the patient's breath,—the air which ascends from his body, especially if the curtains be close,—and the vapour arising from all evacuations. When medical or other duties require a visitor or nurse to be placed in these situations of danger, infection may be frequently prevented by a temporary suspension of respiration.

6. Visitors should not go into an infected chamber with an empty stomach; and, in doubtful circumstances, on coming out, they should blow from the nose, and spit from the mouth, any infectious poison which may have been drawn in by the breath, and may adhere to those passages.” (See Letter to Dr. Percival, p. 73, et seq.)

By observing these rules, not only numerous visitors, but the medical attendants, and the nurses themselves, who frequently move and otherwise affilt the sick, in fever-wards, and the wards of houses of recovery, entirely escape infection. This is proved, with scarcely any exception, in all the institutions of this fort throughout England and Ireland. During the last four years (the writer speaks from personal observation) only one instance of infection feizing a nurse in the London House of Recovery, occurred, and, in that case, the imprudently slept in a bed, just quitted by a convalescent, who had left the house, without changing the linen.

By the same rules, Dr. Haygarth secured the progress of a fatal case, when Winchester and other great schools were diffusing their scholars on account of this most contagious discompliment, which had spread alarmingly among them. Not one was infected after the plan of separation in an unvisited room was adopted, although all the boys remained in the same house. (Let. to Dr. Percival, p. 81.)

Contagion may, however, be extensively circulated by fumes, i.e. attached to clothing, furniture, and other articles, which mode of communication is, perhaps, the most to be apprehended, during the prevalence of an epidemic malady. Hence the severe laws of quarantine have been enacted, in order to prevent this country from the contagion of foreign pestilence, which might be imported with the articles of commerce. And it is not less necessary, during times of internal pestilence, to be watchful in regard to this point. It is not, however, by a flight and brief exposure to contagious misfits, that substances are sufficiently imbued with them, to communicate infection. Thus it is, on the whole, well ascertained that the clothes of visitors do not acquire a pestilential quality, so as to infect others. Upon this point, the experience of several observing practitioners coincides. Dr. Clark of Newcastle affirms, that in eighteen years practice, he never communicated the contagion of small-pox, nor of the scarlet fever, with ulcerated fore throat, to any one, even to children in his own family, although he had frequently, on the same day, visited many patients in those diseased, and in the most malignant stages of the latter, and afterwards had intercourse with other children liable to receive them. Mr. Henry adds his own experience, during nearly forty years, in Manchester, in testimony of the same fact, in regard to the contagion of small-pox. And the testimony of several other practitioners is equally strong, as to the non-conveyance of this contagion by their clothes.

Now, whatever is true of the contagion of small-pox, and of scarlet fever, is still more decisive as to typhous infection, which is less powerful than either. (See Haygarth, Sketch of a Plan, &c. pp. 369, 386, 404, &c.) Substances do not become sufficiently impregnated with the poison, in clean and ventilated places, except by being in a considerable time in contact with, or very near the sick, as the bed in which the patient lies, or the linen he wears; these fumes are chiefly produced in close and dirty places, where the contagion is concentrated by accumulation and confinement, as in the cells of jails, or in the apartments of the poor, in which cases, the utmost virulence of the poison is brought forth.

Where contagion of this degree of activity is produced, and is combined with articles of clothing and furniture, &c. the mere act of ventilation, which effectually prevents
its deleterious action, when arising from the body of the sick, is altogether inadequate to destroy its power in these 
infected. Hence various means have been devised, in all ages, 
for annihilating contagion. Among these, fire has been 
most generally employed, more especially with a view of 
annihilating, or applying the smoke or vapours from different 
substances, to the fource of the poisonous miasms. Hippo-
ocrates and Acron of Agrigentum, believing the air to be 
the medium of infection, are said to have ordered large piles 
of wood to be burnt in the streets and infected parts of 
Athens, by which means they checked the plague in that city. 
(Aeum. Tetrab. Phalarer. de Ind. et Ofir.) But however 
useful the fumigation of fomites may be, it does not appear to 
be of any utility when employed in the atmosphere in ge-

eral. In the year 1721, the plague raged at Toulon with 
with violence, that in the space of ten months it destroyed 
about two-thirds of its inhabitants. Many having inhaled 
upon fires being made in different parts of the city, the 
public records were consulted, and it was then found that, 
on a similar occasion, the same means had been tried without 
succes. The experiment, however, was repeated. Wood 
was laid before every house, and at the found of a bell, all 
the fires were lighted, by which the city was involved in a 

black smoke for nearly a whole day. The plague, however, 
fuddled no abatement. The same measure was repeated 

both at Marsilles and London, when the plague raged in 
these cities, with no better success. Nay, after the fires had 
been kept burning for three days in London, on the night 
which succeeded, no less than 4,000 died, although not more 
than 12,000 had been destroyed during the preceding three 
or four weeks. (Wilson on Febr. Dif. vol. 1. p. 464.) 

There is no doubt, however, that contagion, adhering to 
clothes and furniture, may be effectually destroyed by the 
vapours from various combustible and volatile substances. 
Dr. Lind recommends the fumes of tobacco to be diffused 
through the cells and infected apartments, in prisons and 
sheds, as well as for the purification of infected articles; he 
also advises the exposure of fomites, to the fumes of ful-
phur, from a charcoal fire, as an efficacious mode of puri-

fication. But he is perfectly convinced, he says, from long 
experience, that even the simple heat of a close confined fire, 
or the heat of an oven, is a destroying power which "no 
infection whatever can withstand." The efficacy of gun-power 
was ascertained by an accident, and Dr. Lind afterwards 
used it in wards where fivers were received, every morning. 
In a ship of war, a contagious fever prevailed, which had 
destroyed sixty men; when, in an engagement with the 
French, twenty-five barrels of gun-power were fired 
on board of her during the action; and, to the surprise of 
her officers, none of her men were afterwards attacked with 

fevers. 

Some strong smelling substances, as camphor, the va-
pours of juniper, and of Calcarilla bark, &c. have been 
occasionally resorted to as preventatives from contagion; 

but the power of these substances is very questionable, and 
they may be, perhaps, negatively prejudicial, as their aro-

matic odour may conceal the smell of bad air in the room 
of the sick, and thus prevent effective measures of salutary 
from being employed. 

These are not the means of which we profess of 
destroying contagion in fomites, seem to be the fumes of 
the mineral acids. The vapours of vinegar, and those of 
the sulphuric acid, have been long used with some degree 
of success; but those of the muriatic, and still more, per-
haps, those of the nitrous acid, appear to be complete an-
tidotes to accumulated contagion. The evidence of the 

efficacy of the nitrous acid fume, in purifying infected places

and substances, which was a few years ago laid before the 
House of Commons by Dr. Carmichael Smyth, was such as 
to induce that house to vote a national donation of five 
thousand pounds to him for the discovery. This vapour is 

easily obtained, by mixing with powdered nitre a little of 
the strong acid of vitriol or sulphuric acid; the latter com-
bines with the poisons, the base of the nitre, expelling at 
the same time the nitrous acid in fumes. (See Dr. C. 
Smyth's treatise on the subject.) 

The muriatic acid may be obtained in a similar manner, by 
using common sea or rock-lime, instead of nitre. 

Where contagion has been long pent up in close cells or 
rooms, it is apt even to adhere to the walls. In such cases, 
whilst-walking with hot or newly fired lime, is an efficacious 

aid of the acid fumigations. 

It is a curious fact, and perhaps wholly unaccountable 
upon any theory of the propagation of contagion, that peri-

tential diseases, after running an indefinite course, notwith-

standing all the measures adopted to restrain their progress, 
very frequently cease spontaneously, at a time when the walls 
of the houses, furniture, &c. must still be supposed to be high-
ly impregnated with the contagion. The fact is authenti-

cated by Dr. Ruffell, Dr. Lind, and several other phy-
cians of equal respectability. The cessation is not con-

nected with any sensible changes in the atmosphere. Warm 
weather is perhaps, on the whole, but not without many 
exceptions, more favourable to the production of contagious 
diseases than cold weather. But the worst fevers 

have often raged in the coldest seasons; as did the plague 
in London; and there have been instances of the plague 

furling a check as the weather grew warmer. (Wilson 
on Febr. Dif. p. 448.) 

During the prevalence of a contagious epidemic, tem-

perance and regularity, and care in avoiding all causes of 
dibility, (such as cold damp air, &c.) the use of the cold 

bath, and the preservation of an equal state of mind, are 
great personal preservatives. The general alarm which 
prevails during these periods of public calamity, is not among 
the faults of the cauca which contribute to extend the evil. 
It would be, therefore, injudicious to condemn the use 
of camphor, rosemary, and other aromatic substances, or car-

rying a quill filled with quicksilver, or other amulet, about 
the person, since whatever tends to inspire confidence in 
the mind, contributes to the security of the body. 

CONTARI, in Antiquity, a kind of horsemens, whose 

chief armour was the canteus, a kind of long spear. 

CONTARINI, GASPARD, in Biography, a cardinal of 

the church of Rome, was not more celebrated as a divine 
than as a politician. He flourished in the Venetian terri-

tories, and was nominated from that republic as ambassadoor 
to the emperor Charles V., after which he was raised to a con-

siderable station in the government of his country. He was 
ambassador also to Rome; and when pope Clement VII. 
surrendered to the imperial army, a commission was given 
to Contarini to negotiate for the liberty of the pontiff. In 
1535, he was created cardinal by pope Paul III.; and in 
1541, he was appointed legate to Germany, and with the 
other legates was appointed to preside at the general coun-
cil, which was afterwards held at Trent; he was, however, 

sent legate to Bologna, before that assembly met, where he 
died at the age of 65, in the year 1542. He was author of 
many works, and on various topics, in which he displays con-
iderable talent, and a mind superior to the times in which 
he lived. The principal pieces are "De Immortalitate 
Animae," "De Septem Ecclesiae Sacramentis," "De 
Potestate Papa," "De Predelectinatione," "De Libero Ar-

bitrio," and "Coniunctio Articulorum Lutheri." 

Con-
CONTRARI, Vincent, a considerable scholar in classical literature and antiquities, was born at Venice, in 1577, and attained the profeship of the Greek and Latin languages at Padua, which he held with great reputation till the year 1614, when he retired to Rome. From thence, taking a journey into Itria, he fell ill, and died at Venice in the prime of life, in 1617. The works by which he is chiefly known are "De Frumentia Romanorum Largitione," and "De Militari Romanorum Stipendio," Morari.

CONTRARINO, Cav. Giovanni, an historical and portrait painter, who was born at Venice in the year 1549, and who steadfastly pursued the solid and pure style of Titian, not withstanding the pernicious example of almost all his rival compatriots, who, losing the remembrance of those glowing and rich tints which had so long been the boast of the Venetian school, had adopted a manner in which the lights were so extravagantly contoured by the most obtuse and cutting shadows, as to give to their pictures the appearance and gloom of midnight representations. The principal works of Contrarino are at Venice, and evidence, independent of the beauties of colouring, a very competent knowledge of foreshortening and the "fato in fo," with an excellent talle of composition. One of his best and greatest performances is the ceiling of the church of St. Francisco di Paola, where, in the column, he painted the Resurrection of Christ, and on each side the Assumption and Nativity, together with the Evangelists and the four Doctors of the Church. He executed several memorable works for the court of the emperor Rudolph II., who conferred on him the honour of knighthood. His portraits bore so strong a resemblance to nature, that one of them, representing Marco Dolce, is said to have deceived his dogs and other domestic animals, who leaped up to the picture, supposing it their master himself. Thus artif died in the 56th year of his age, 1605. Lanzi, Storia Pictorica.

CONTAY, in Geography. See Conty.

CONTCHOUSONG, a town of Afia, in the country of Thibet; 320 miles N.E. of Laffa. N. lat. 30° 20'. E. long. 95° 26'.

CONE, del, Jacopino, in Biography, was born at Florence in 1510, and is said in his youth to have received from instructions in painting, in the school of Andrea del Sarto. Having completed his studies, he soon gave proofs of superior talents, both in historical and portrait painting, but whether he was invited under pope Paul III., was the theatre of his labours, and he was employed to paint the portraits of that pontiff and of his succesor Clement VIII., as well as those of the cardinals, the ambassadors, and other nobles of the court. In historical painting, he had no less success; and the frescoes, which he executed in the church of St. Giovanni Decollato, rank him among the best artists at the decorat or extravagant of the imitators of Micheangelo. An utter-piece in the famous church, representing the taking down from the cross, a composition of many figures, is considered his "chef d'oeuvre." He died at Rome in 1598. Baglione.

CONE, del, or Fassi, Guido, an artist who was born at Carpi, in the state of Modena, in the year 1584, and was the first inventor of the "fagiola," a species of composition, or paste, with which the finest marbles are with facility imitated, and which acquires sufficient hardiness to bear a polish. Some of the works of Guido, particularly two altars, are still existing at Carpi, where he died in the year 1649.

This art has since been brought to such a degree of perfection in several parts of Italy, that not only the finest marbles have been counterfeited, so as occasionally to deceive the best judges; but likewise bas-reliefs, vases, medals, and even pictures of great beauty, have been produced: see Info.

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much that it is become an article of commerce. (See STAG, LIOLA.) Lanzi, Storia Pitterica.

CONTEMPLATION, an act of the mind, whereby it applies itself to consider, reflect on, and admire, the wonderful works of God, nature, &c.

Contemplation is the height of perfection of the mystic divines. See MYSTIC.

CONTEMPORARY, or Contemorary, a person, or thing, of the same time, or that existed in the same age, with another. Socrates, Plato, and Aristophanes, were contemporaries: the best histories are those of contemporary authors.

CONTEMPT, in the Doctrine of the Paffions, is a species of hatred, expressing in its general sense disapprobation or aversion, which arises from the mere consideration of a worthless object, especially if it be proposed to us under a pretence of its polishing excellence; or from misconception in things not of themselves vicious; as, where a person either acts below his station and character, or affects to do that for which he is not qualified. It is opposed to esteem or to emulation. This is one of those passions which in oratory belongs to demonstrative discourses. Thus Cicero (De Orat. lib. ii. c. 12.) endeavours to expose Caecilius, and bring him into contempt of the court, for pretending to rival him in the acclamations of Verres, for which he was altogether unfit.

Contempt, in Law, is disobedience to the rules, orders, or processes of a court, which hath power to punish such offence; and a man may be imprisoned for a contempt done in court, but not for a contempt out of court, or for private abuse. But for contempt out of court, an attachment may be granted. Cro. Eliz. 680.

Attachment also lies for contempt to the court, to bring in the offender to answer on interrogatories, &c. and if he cannot acquit himself, he shall be fined. 1 Litt. 305. If a sheriff, being required to return a writ directed to him, doth not return the writ, it is a contempt: and this word is used for a kind of misdemeanor, by doing something which is forbidden, or not doing what is commanded. 2 Rep. 36. As the degrees of this crime vary, the punishment is either or greater; sometimes a mere fine, and sometimes imprisonment.

If a defendant in chancery, on service of a subpoena, does not appear within the time limited, by the rules of the court, and plead, demur, or answer to the bill against him, he is then said to be in contempt; and the respective proceedings of contempt are in successive order awarded against him: these are attachment; attachment with proclamation; a committal of rebellion; and, finally, a sequestration. It is a contempt to institute a suit fictitiously, though the demand is real, either to hurt any person, or to get the opinion of the court.

The most remarkable instances of contempts may be reduced to the following heads: 1. Contempts of the king's writs: contempt in the face of a court; contempt of words or writings concerning the court; contempt of the rules or orders of the court; abuse of the proceeds of the court; and forgeries of writs and other decrees tending to impose on the court. 2. Hawk. P. C. c. 22. § 3. For an account of the contempts that are punished by attachment, see ATTACHMENT.

Contempts or misprisions (see Mispription) are offences against the king and government: such as the misadministration of high officers, in public trust and employment, usually punishable by the method of parliamentary impeachment, and subject to the penalties of banishment, imprisonment, fines, or perpetual disability: such is also the offence of embezeling the public money; and such are those cont.
tempts of the executive magistrate, which demonstate themselves by some arrogant and undutiful behaviour towards the king and government. Contests against the king's prorogative are a refusal to affit him by advice in his councils, and by peronal service in his wars, against a rebellion or invasion. To this classes may be referred the neglect of joining the "poite comitatus," or power of the county, when required by the sheriff or justices, according to the statute 2 Hen. V. c. 8; which is a duty incumbent upon all that are 15 years of age, under the degree of nobility, and able to trace. Contests against the prorogative are also a preference of the interests of a foreign potentate to those of our own, and doing or receiving any thing that may create an undue influence in favour of such extrinsic power; as by taking a pension from any foreign prince, without the king's consent; also, a disobedience to the king's lawful commands, refusing by writs out of his courts of justice, or by summons to attend his privy council, or by letters from the king commanding a subject to return from beyond the seas: and likewise disobedience to any act of parliament; all which contests are punishable by fine and imprisonment, at the discretion of the king's courts of justice. Contests and misprisions against the king's person and government may be by speaking or writing against him, cursing or wishing him ill, giving out scandalous stories concerning him, or doing any thing that may tend to degrade him in the esteem of his subjects, weaken his government, or excite jealousies between him and his people. Contests against the king's title, not amounting to treason or pramunire, are the denial of his right to the crown, in common and unadvised discourse; punishable by our law with fine and imprisonment. If any person affirm or maintain, that the common laws of this realm, not altered by parliament, ought not to direct the right of the crown of England; this is a misdemeanour, by stat. 15 Eliz. c. 1, and punishable with forfeiture of goods and chattels. A contest may also arise from refusing or neglecting to take the oaths, appointed by statute for the better securing of the government; and yet acting in a public office, place of trust, or other capacity, requiring the said oaths to be taken, viz. those of allegiance, supremacy, and abjection; which should be taken within six calendar months after attaining the age of 21. The penalties inflicted by statute 1 Geo. I. stat. 2. c. 15, are little short of those of a pramunire; being an incapacity to hold the said offices, or any other; to prosecute any suit; to be guardian or executor; to take any legacy or deed of gift; and to vote at any election for member of parliament: and after conviction the offender shall also forfeit 50l. to those who will sue for it. Contests against the king's palaces or courts of justice have always been regarded as high misprisions; and by the ancient law, before the conquest, fighting in the king's palace, or before the king's judges, was punished with death. And at present with us, by stat. 33 Hen. VIII. c. 12, malicious striking in the king's palace, where he resides, whereby blood is drawn, is punishable by perpetual imprisonment and fine at the king's pleasure; and also with all the losses of the offender's right hand. But striking in the king's superior courts of justice, as Westminster-hall, or at the assizes, is made full more penal. By the ancient common law, before the conquest, it was a capital felony; and our modern law subduces to the losses of life that of the offending limb; the crime, and even drawing a weapon, being punishable with the losses of the right hand, imprisonment for life, and forfeiture of goods and chattels, and of the profits of the offender's lands during life. (See Assault, &c.) A rescue of a prisoner from any of the said courts, without a blow, is punished with perpetual imprisonment, and forfeiture of goods, and of the profits of lands during life. Even in the inferior courts of the king, an affray, or contemptuous behaviour, is punishable with a fine by the judges there sitting; as by the steward in a court-leet, or the like. Those also who are guilty of any injurious treatment to such as are immediately under the protection of a court of justice, are punishable by fine and imprisonment. Lastly, to endeavour to dissuade witnesses from giving evidence; to diuise an examination before the privy-council; or to advise a prisoner to fland mute, are high misprisons and contests of the king's courts, and punishable by fine and imprisonment. If one of the grand jury diuises to any person indicted the evidence that appeared against him, he is guilty of a high misprison, and liable to be fined and imprisoned. Blackft. Comm. vol. iv.

CONTENEBRA, in Ancient Geography, a town of Italy, in Etruria, mentioned by Livy.

CONTENEMENT, a word in our Ancient Law-books, about whose signification authors are not rightly agreed. According to Home, it should signify the countenance, credit, or reputation, a person has, from and by reason of his freehold. In which sense it is used in the flat. 1 Edw. III. &c. where it stands as synonymous with countenance.

Others will have it signify what is necessary for the support and maintenance of men, according to their several qualities, conditions, or states of life. Thus, Seldman, Contenentum est affirmation, & conditionis forma, quae quis in republica subjicit. And in this sense it occurs in Magna Charta, cap. 14.

CON TfENSON, Vincnt, in Biography, a French Dominican monk, was born at Condom, in 1640, and celebrated in his time for considerable pulpit talents. He left behind him a work of reputation, entitled, "Theologia mentis et cordis," which has passed through several editions in folio and in octavo.

CONTENENT, in Mathematics, a term frequently used for the capacity of a vessel, or the area of space; or the quantity of any matter, or space, included in certain bounds. The content of a tun of round timber is 43 solid feet. A load of hewn timber contains 92 cubic feet: in a foot of timber are contained 1728 cubic or square inches, and as goes 1728 inches are contained in a piece of timber, be it round, or square: so many feet of timber are contained in the piece.

In gauging, the gallon for beer and ale is allowed to contain 282 cubic inches, and the wine gallon 231; the gallon of dry measure 272.

Hence, as oft as 282 cubic inches are contained in any vessel, round or square; so many gallons of ale or beer it holds; and the like may be observed of the other measures.

Multiply, therefore, one side of a square, or oblong, into the other; and divide by one of those numbers, according to the quality of the liquor; the quotient gives the area in gallons, upon an inch deep.

Though the work may be considerably shortened by only multiplying the sides of squares, or the diameters of rounds, into themselves; the product is the number of gallons, and parts, the vessel contains, upon an inch in depth: and when that receives an augmentation, by being two, three, or four inches deep, it then commences a field body, and contains as many gallons, and parts, as it has inches and parts deep.

A cubic foot contains six gallons and almost a pint of ale and beer; and seven gallons two quarts of wine. A cubic foot of dry measure contains six gallons and a half, and...
something more. A bushel of salt contains 56 pounds avoirdupois. See GAUDE.

CONTENTIOUS JURISDICTION, in Law, denotes a court, or assembly, which has a power to judge and determine differences between contending parties.

The lords chief justices, judges, &c. have a contentious jurisdiction; but the lords of the treasury, the commissioners of customs, &c. have none; being merely judges of accounts and transactions.

CONTENTMENT, in Pathology and Ethics, expresses the acquiescence of the mind in the possession of the good that is affiliated to us. It implies a perception that our lot might have been better, or that it is inferior to what others enjoy, or that it does not fully answer the expectations we had formed. An effort of reason, or of prudence, or of religious principles, is necessary to produce it. We compare our present with our former situation, or with the inferior lot of others; and thus learn to acquiesce in the degree of advantage which we have obtained. A regard to the dispositions of Providence, wise, righteous, and benevolent, will very much contribute to the acquisition and exercise of the virtue of contentment.

CONTESSA, in Geography, a small town of European Turkey, in the province of Macedonia, situated in the bay of the same name, with a good harbour, on the coast of the Archipelago ; 51 miles N.E. of Salonic. Long. 4:1°. 55'. At the entrance of the Gulf of Conetta is situated the island of Tagra. The French navigators also call this bay " Golfe de Rhodinie," from the corrupted name of the ancient town of Rhodié; but the Greeks designate it under the name of Orfano. It is the Sinus Strimonicos of the ancients.

CONTESI, in Ancient Geography, a people of Hispania Citerior, to the south of the Edetani. Their territory extended southwards as far as Betica, or at least to the extremity of the Tarragonenis, where are found some places dependent on the Bautiltani, who inhabited part of the eastern Betica.

CONTESI, a country of Spain, in the Tarragonenis, mentioned both by Pliny and Ptolomey. The former says, that this country was first called "Matavania," afterwards "Deltania," and then Contesia. Here the authors place the river Tader, the colony of Illici, Lacentum, Diniun, the river Sacro, &c.

CONTETTATIO LITIS, among Civilians, denotes a general affirmtion that the plaintiff hath no ground of action, which affirmation is afterwards extended and maintained in his plea.

CONTEX, among Divines and Critics, that part of Scripture, or other writing, which lies about the text, before or after it, or both. To take the full and genuine sense of the text, the context should be regarded.

CONTEXURE, a word frequently used in speaking both of the works of nature and art; and denoting the disposition and union of the constituent parts with respect to one another.

CONTHIL, in Geography, a town of France, in the department of the Marne, and district of Chateau-Salins; 2 leagues N.N.W. of Dieuze.

CONTHILA, in Ancient Geography, a borough of Greece, in Attica; placed by some in the Ptolemaic tribe, and by others in the Pandionide.

CONI, Giusto DE, in Biography, an Italian poet and lawyer. His verses are chiefly amatory; and they appeared under the title of "Della Morte," on account of the beautiful hand of his mistress, which is the subject of frequent adulation. He died in 1409, and his poems have been published at Venice, Paris, Verona, and Florence. He has been compared to Petrarch; but the best judges have regarded him as much inferior to that writer. Moretti.

CONTI, CESARE and VINCENZIO, two brothers, the former, a native of Ancona, was celebrated as an expectation painter of grotesques; the latter, born at Rome, was a painter of history.

Baglione enumerates many considerable works, in which these artists were employed at Rome, under the pontificate of Sixtus V. and Gregory XIII. Vincenzo ultimately settled in Turin, where he was taken into the service of the duke of Savoy. They both died during the pontificate of Paul V., Baglione.

CONTI, DOMENICO, of Florence, was the beloved disciple of Andrea del Sarto, and heir to his designs and studies. In gratitude and veneration to the memory of his great master, Conti, at his own expense, erected the monument still remaining in the cloister of the Nunziata, where the bust of Andrea is finely sculptured by the hand of Raffaello di Monte Lupo. Of Domenico's works in painting little is now known. Orlandi.

CONTI, CARLO, an engraver, native of Lorraine, in 1742. He established himself at Vienna, where he was reputed a good artist. He was living in 1799. Heinecken.

CONTI, FRANCESCO, an historical painter, born at Florence, in the year 1681. He travelled to Rome, where he became the disciple of Carlo Maratti. On his return, he acquired sufficient reputation to merit a place in the celebrated collection of portraits in the Florentine gallery. He died in the year 1760. Lanz, Storia Pitt.

CONTI, GIACOMO. See GIZIELLO.

CONTIGLIANO, in Geography, a town of Italy, in the duchy of Spoleto, near a lake to which it gives name; 3 leagues W. from Rieti.

CONTIGNE, a town of France, in the department of the Maine and Loire, and district of Segré; 3 miles N. of Chateauneuf.

CONTIGUITY, the relation of bodies touching one another. See CONTINUITY.

CONTIGUOUS, a relative term, under foot of things disposed to near each other, that they join their surfaces, or touch.

The houses in ancient Rome were not contiguous as ours are, but all insulated.

CONTIGUOUS ANGLES, in Geometry, are such as have one leg common to each angle; otherwise called adjoining angles, in contradistinction to those produced by continuing their legs through the point of contact, which are called opposite or vertical angles.

CONTINENCE, in Ethics, a moral virtue, by which we refit concupiscence. It should seem that there is this distinction between chastity and continence, that it requires no effort to be chaste, which results from constitution; whereas continence appears to be the consequent of victory gained over ourselves. The verb continere, in Latin, signifies to restrain.

CONTINENT, in Geography, a terra firma, main land, or a large extent of country, not interrupted by seas; so called, in opposition to island, peninsula, &c. See EARTH, OCEAN, &c.

Sicily is said to have been anciently torn from the cont-
CONTINENT.

The entire separation of Great Britain from the Continent must have happened long after the deluge, and that of Ireland from Great Britain at a still later period; for wolves and bears were anciently found in both, and these must have passed from the Continent into Britain, and hence into Ireland, as it cannot reasonably be supposed that they were imported thither. The divinitive force, says Kirwan (ubi supra), that separated Britain from Germany, seems to have been directed from North to South, but gradually weakened in its progress. Hence that island is sharpened northwards; but the impression must have been considerably weakened by the opposition of the granitic mountains that form the Shetland and Orkney isles. The rupture of the isthmus that joined Calais and Dover was probably effected by an earthquake at a later period, and gradually widened by tides and currents. Ireland was protected by Scotland from the violence of the northern shook; and therefore its separation from Scotland appears to have been late and gradual. That from England was probably diluvial, and effected by a southern shook. All these changes happened 3600 years ago; and there is no reason for thinking that the general level of the ocean has been since altered; but that of the continents seems to have varied considerably, being in some places higher and in some lower than it was in ancient times.

The world is ordinarily divided into two grand continents; the Old and the New; the Old comprehends Europe, Asia, and Africa; the New the two American, North and South.

The separation of the two continents Kirwan (ubi supra) supposes to have probably been the effect of excavation by volcanoes; at least, he says, this cause is adequate to such an effect; and it still exists in the most northern parts; the superior fertility of the western coast of America may arise from the lavas ejected on that coast. But however this separation was effected, we have no traditional account of it, and the period in which it happened is no less difficult to be ascertained than the cause which produced it.

M. Buffon affirms, that they were not separated when the elephants lived equally in the north of Europe, Asia, and America, the bones of which have been found in Russia, Siberia, and Canada. Hence he concludes, that the separation of the two Continents must have happened after the abode of these animals in the northern regions. But it has been doubted whether the remains of elephants and of the rhinoceroses that have been lately found in Siberia, even allowing that the temperature of this country was ever so fituated to the constitution of these animals as to admit of their living in it, belonged to animals which ever lived in it. As to the mode of their formation, we have different conjectures and theories, of which an account will be given under the articles DELUGE and EARTH.
CONTINENT.

Mexicoo Jamaica and Cuba; from thence along the peninsula of Florida, through Apalache, Chicachas, and from thence to St. Louis, Fort le Sieur; and terminates in the country bordering on Lake Affinibah to the extent of which is unknown. This line is interrupted only by the gulf of Mexico, is about 2500 leagues in length, and divides the New Continent nearly into two equal parts; that on the left containing 1,069,264 square leagues, and that on the right 1,070,926⁴; the difference of which is 1694, or scarcely 1⁴ degree square. This line is the middle of a belt of land, called the New Continent, and is inclined to the equator somewhat, less than 30°, but in an opposite direction to the former; for that of the Old Continent extends from the N. E. to the S. W.; but that of the New Continent from N. W. to S. E. The superficial contents of the Old and New Continents are about 7,080,992 square leagues, i.e. not near a third part of the surface of the globe, which contains 25,000,000 square leagues. Of these lines which divide the Continents into equal parts, it may be remarked, that they both terminate at the same degrees of N. and S. latitude; and that the two Continents make mutual advances, or projections, exactly opposite to each other; viz. those on the African coast, from the Country of Tartary, to Guinea; and those of America, from Guiana to the mouth of the Rio-Janeiro. It appears, therefore, that the most ancient lands on the globe are those which extend from 200 to 250 leagues on each side of the two lines above described.

Agreedly to this idea, it is found that, in the Old Continent, the most ancient countries of Africa are those which extend from the Cape of Good Hope to the Red Sea and Upper Egypt, and are about 500 leagues broad; and, consequently, that the whole western coast of Africa, from Guinea to the Straits of Gibraltar, are new lands. In the same manner, if we trace this line through Asia, and include an equal breadth, we shall find, that the most ancient lands of the world are the two Arabian, Perista, Georgia, Turcomania, a part of independent Tartary, Circisia, part of Mulucy, &c.; and, of course, that Europe, and perhaps also China, and the eastern part of Tartary, are comparatively new countries.

In the New Continent, we shall likewise find, that Terra Magellanica, the eastern part of Brazil, the country of the Amazon, and the Guianas, are old lands, when compared with Tucuman, Peru, Terra Firme, the islands in the gulf of Mexico, Florida, the Mississippi, and Mexico. Moreover it may be observed, that the Old and New Continents are nearly opposite to one another. The Old Continent extends farther north of the equator than south; but the New, farther south than north. The centre of the Old Continent lies in the 16th or 18th degree of N. latitude; and the centre of the New Continent lies in the 16th or 18th degree of S. latitude; as if they were intended to counterbalance each other. Besides, both continents resemble one another in this respect that they might be divided into two portions, which would be surrounded on all sides by the sea, except the two small islands of Suez and Panama. It is observable that the prodigious chains of mountains in these two continents run from W. to E. in the Old Continent, and from N. to S. in the New. In the Old Continent there are about 450 rivers which directly fall either into the Ocean, or into the Mediterranean and Black seas. But in the New Continent we know only of 135 rivers which fall immediately into the sea. Both the Old and New Continents appear to have been encroached upon by the Ocean in the same latitude; both are furnished with a great Mediterranean and a vast number of islands, which likewise lie nearly in the same latitude. The only difference is, that the Old Continent, being much larger than the New, has a Mediterranean on its west coast, to which the New Continent has nothing analogous. But both seem to have undergone similar revolutions. These revolutions are greatest near their middle parts, or between the tropics, where the motion of the sea is most violent. For other particulars relating to these Continents, we refer to the description of their respective countries.

It has been remarked, that a considerable portion of the elevated and solid matters or strata which form our Continents, are opposite to a large or deep ocean at the anti-podes or opposite side of the earth: and this circumstance affords matter for important reflections, when we take into our account that these parts, now so considerably elevated above the level of the Ocean, once formed part of its bottom, as appears from the nature and disposition of the strata themselves, but more especially from the shells and other aquatic remains found lodged in them, in a perfect and unbroken state, lying in the same manner and positions, as the shells, &c. of living animals are found to be distributed, on the bottom of the sea, in places where divers have had opportunities of examining them. The following observations were naturally presented themselves; has the quantity of water on the earth been so much diminished, as to by the continuance thus bare; or, has the centre of gravity of the earth been so deranged, as to occasion the waters to accumulate in particular places and leave others uncovered? For a long time there seemed little difficulty in solving the mystery, by answering the first question in the affirmative, on the principles of those who maintained, that the earth was only a hollow crufh or shell of matter, and that great part of the waters of the universal ocean had retreated into the internal cavities of the globe. But since the labours of British philosophers have concurred in proving, that the specific gravity of the earth is much diminishecl, or little more) and all the earth and stones (whose specific gravities do not exceed 2 or 2' on the average) are included; we are forced to conclude, not only that the central parts of the globe are solid, but composed also of much heavier materials, than those which constitute the superficial strata. And another circumstance also must be considered the improbability of any large cavities being filled with water in the interior parts of the earth, viz. the strata, which in universal are found, breaking and dividing even the hardest rocks and strata, into comparatively small and irregular fragments, so as to render them incapable of arching or supporting themselves over water without an actual contact or bearing upon each other: and accordingly cavers or grottos of any considerate size are rarely met with in mining, and these principally, if not entirely, in very hard limestone strata, near the surface, and carrying but a comparatively small load of superincumbent strata.

This ruptured and broken state of the solid matters of the globe, has probably fitted them for obeying the action of the centrifugal force generated by its diurnal revolution, and in affuming nearly the form of an ellipsoid, (as the late measurements of degrees upon the earth's surface in various parts of the world have shown,) otherwise, most probably, the equatorial parts of the earth must have been occupied by a zone of water instead of possessing islands and parts of Continents in common with other parts of the world, as they now do. Let the reader but consider the immense weight of solid matter which exists above the level of the sea, or general ellipsoidal lines of equilibrium, in one of our Continents, and suppose a cylindrical perturbation to be made under such Continent, quite through the earth to the opposite ocean, so
as to separate, for the sake of argument, this cylindrical column of the earth and water from the rest of the earth, (as the broken state of the frusta and the actual hardncss of their fragments entitles us to suppose possible) and it will appear, as a necessary consequence of equilibrium, that the continent and frusta under it to the centre of the earth must be equal in weight to the same space of Ocean at the antipodes, and the frusta under its bottom extending to the same centre; for if there were different, and we suppose the Continent to preponderate, it is plain from the waters of the Ocean covering the other end of the cylinder being at liberty to recede, that they would do so, and the Continent would sink and the bottom of the opposite Ocean would rise, until the equilibrium was restored; and in like manner if the frusta under the ocean be supposed the heaviest, a further protration and consequent elevation of the Continent, compared with its surrounding seas, would ensue. This view of the subjedt leads, in the opinion of the writer of this part of our article, to the conclusion, that a very large mass, or perhaps several masses of matter of a high specific gravity, now occupy the bottom of the Ocean opposite to the Continents and large islands, which were not there at the time that those Continents occupied a lower place in respect to the centre of the earth, and were covered by the universal Ocean; and he thinks, that he has discovered the source whence these very heavy and diluting masses of matter were derived, in the disappearance of some immense satellar body which apparently for a long period revolved round this earth, very near to its surface, and occasioned tides so rapid and enormous, as to heave up the land and break the frusta into innumerable fragments, permanently demodating some parts, when elevated above the point of equilibrium between the earth and satellite's attraction, and pouring down upon other parts of the surface, such torrents of the ruins of abraded frusta, as entirely to hide the frusta of these districts under alluvial coverings; forming, in numerous islands, hills of great height and extent, containing large and irregular fragments of rocks, and different known frusta, thrown together throughout their whole thickness and extent, in the greatest apparent confusion. For other observations and conjectures, relating to this subjedt see Earth.

The discovery of a southern Continent has been an object of curious and diligent investigation; but hitherto without success. Captain Cook's second voyage commenced in the year 1772, was undertaken with a particular view to the discovery of the question, concerning the existence of a southern Continent. In the prosecution of this voyage, and while he was proceeding southward in quest of a Continent, he fell in with ice islands, in S. lat. 56° 45' and 7° of longitude from the Cape of Good Hope; in his farther progress, he was stopped by other fields of ice, which led him to imagine, from a notion that these are formed in bays and rivers, that he could not be at a great distance from land. But having failed in S. lat. 55° 40' for more than 30 leagues along the edge of the ice without finding any opening, he found that this ice did not join the land; and therefore he thus discovered the fallacy of the general opinion, that ice is always a form of the vicinity of land. The observations of captain Cook confirmed those of other navigators, that the end of the southern seas is much more intense than that of equal latitudes in the northern hemisphere; and he also ascertained that this cold was not owing to the vicinity of a Continent, as had formerly been imagined. On the contrary, it was now determined beyond dispute, that if any such Continent existed in the easterm part of the southern Ocean, it must be confined within the latitude of 60°. Having advanced as far as S. lat. 62° 10' and W. long. 172°, he found the farther he proceeded that the number of ice islands very much increased; and in lat. 67° 31' and W. long. 142° 54', he got into such a clutter of these islands that it was both difficult and dangerous to escape them. Finding it impossible to get any farther to the southward, he determined to explore a considerable tract of sea to the north of his present situation, and then again to stand to the north. But in this he was unsuccessful; no land being discovered either in falling northward, eastward, westward, or southward, though he proceeded in the last direction as far as 71° 10' S. lat. and 105° 54'. W. long. It was now impossible to advance; and it was the opinion of the captain himself, as well as of most of the gentlemen on board, that the ice by which they were now stopped extended as far as the pole. The most southerly land discovered by this persevering navigator was that on which he bestowed the name of "Southern Thule," and which is situated in S. lat. 55° 13' 30'. W. long. 27° 45'. Here not a single herb of any kind was seen, but very high and barren mountains, the tops of some of which reached above the clouds; and we may observe, that this seems to be the only part of the world hitherto discovered, altogether unfit for the support of animal life. This country was discovered on the 31st of January 1775. Upon the whole, it may be concluded, that the greatest part of the southern Continent, if it has any existence, must be within the polar circle, where the ice is so encumbered with ice, that the land must be inaccessible. So great is the danger in navigating these southern seas, that captain Cook isfers on the most probable grounds, that such lands as lie to the southward of his discoveries could not be explored; and that even no man could venture farther than he had done. Thick fogs, snow-storms, intense cold, and every attendant circumstance that can render navigation difficult and dangerous, must be encountered; and all these difficulties and dangers are heightened to a very great degree by the inexpedibly horrid aspect of the country itself. It is a part of the world deemed by nature never to feel the warmth of the sun's rays, but to be buried in everlasting snow and ice. Whatever parts there may be in the coal, they are almost entirely covered with frozen snow of a vast thickness. If however any of them should be so far open as to invite a ship into it, she would run the risk of being fixed there for ever, or of coming out on an ice island. Besides, the islands and floats on the coast, the great falls from the ice-cliffs in the port, or a sudden snow-storm, might be attended with equally fatal effects. For these reasons captain Cook determined to abandon the pursuit of a land, whole existence was equivocal, but whose mutiny, if it could be discovered, was certain.

After captain Cook's persevering and fruitful travels through every corner of the southern hemisphere, who, for the future, says the editor of Cook's third voyage (vol. 1. Int. p. 56), will pay any attention to the ingenious reveries of Campbell, de Brofies, and de Buffon? or hope to effluft an intercource with such a continent as Maupertuis's fruitful imagination had pictured? A Continent equal, at least, in extent, to all the civilized countries in the known northern hemisphere, where new men, new animals, new productions of every kind, might be brought forward to view, and discoveries be made, which would open inexhaustible treasures of commerce. (See Maupertuis's Letter to the King of Prussia.) The author of the Preliminary Discourse to Bougainville's "Voyage aux Illes Malvines" computes, that the southern Continent (for the existence of which, he owns, we must depend more on the conjectures of philosophers, than on the testimony of voyagers) contains 8 or
8 or 10 millions of square leagues! We can now boldly take it upon us to disconform all expeditions formed on such reasonings of speculative philosophers, into a quarter of the globe, where our persevering English navigator, instead of this promised fairy land, found nothing but barren rocks, hardly affording shelter to penguins and seals; and dreary seas and mountains of ice, occupying the immense space allotted to imaginary paradies, and the only treasures there to be discovered, to reward the toil, and to compensate the dangers of the unavailing search.

CONTINGENCY, in Metaphysics, denotes the mere possible existence, or non-existence, of an object in any future time; and is opposed to necessity; which is. See also CHANCE and PROBABILITY.

CONTINGENCY of blood, in the writers of the laws of Scotland, is used for proximity of blood. Bayne, Crim. Law, p. 48.

CONTINGENT, literally signifies what may or may not happen, what is casual or uncertain, and depending upon chance. See CHANCE. But in military acceptance, it denotes the quota or proportion of troops, money, and ammunitions, which each of a body of legions or confederated sovereigns, or princes, furnishes upon emergencies, when required or called on, in virtue of and in support of the confederation. In the wars of the German empire, each prince and state, and all the members of the Germanic body, were obliged to furnish their contingent. In like manner the princes forming the confederation of the Rhine, are, at present, obliged to furnish their respective contingents.

CONTINGENT bill, of a regiment, is an account of the extra charges, which a regiment, in the due course of service, is from circumstances unavoidably and accidentally under the necessity of incurring.

CONTINGENT line, or tangent-line, in Dialling, denotes the intersection of the planes of the dial and equinoctial, and it intersects the subfible or subfilar line at right angles.

CONTINGENT legacy, is a legacy depending on the age of the legatee; if it be left to any person, when or if he attains the age of twenty-one, and if he dies before that time, it is a lapsed legacy; but if it is left to be paid when he attains that age, it is a vested legacy; and if the legatee dies, his representatives shall receive it out of the tellator's estate at the time, when it would have become payable, if the legatee had lived.

CONTINGENT, or Executive remainder, in Law, is where an estate is limited to take effect, either to a dubious and uncertain person, or upon a dubious and uncertain event: so that a particular estate, which does support a remainder, may or may not determine before the remainder may come. This kind of remainder is opposed to vested or executed remainders. 3 Rep. 25. See REMAINDER.

CONTINGENT use, in Law, is an estate limited in a conveyance of land, which may, or may not, happen, to vest, according to the contingency expressed in the limitation of such use. An use in contingency is such which by possibility may happen in possession, reversion, or remainder. 1 Rep. 121. See USE.

CONTINGENTS are sometimes also used by mathematicians in the same sense as ligments.

CONTINI, GIAMBATTISTA, in Biography, an architect who enjoyed considerable reputation at Rome in the latter part of the 17th and the beginning of the 18th century. He was born in the year 1641, and after having acquired at the schools a competent knowledge of languages, the Belles Lettres, and geometry, was placed by his father, who was likewise an architect, under the tuition of the celebrated Bernini. The instructions of his master were not thrown away, and Giambattista became employed by several of the first families of Rome. He constructed many of those magnificent altars and chapels with which the churches of Rome abound, and built the duomo of Vetralla as well as that of Vignarola. His works are enumerated by his biographer Lionel Pafcoii, who informs us that he lived highly respected, and died in 1723. Pafcoii.

CONTINUAL CLAIM. See CLAIM CONTINUOUS.

CONTINUOUS PROPORTIONS. When in a series of quantities the first is to the second as the second to the third, and the third to the fourth, the fourth to the fifth, &c., they are called CONTINUOUS PROPORTIONS; such are 1, 2, 4, 8, 16, 32, 64, &c., where the terms increase in a two-fold ratio; and 1, 3, 9, 27, &c., where they decrease in a triple ratio. Such a series is otherwise called a progression.

CONTINUANCE, in Law, is much the same as progression among the civilians. It denotes the continuance of a cause in court, by an entry upon the records there for that purpose. After issue or demurrer joined, as well as in some of the previous stages of proceeding, a day is continually given and entered upon the record, on which the parties are to appear, from time to time, as the exigency of the case may require. The giving of this day is called the "continuance," because thereby the proceedings are continued without interruption from one adjournment to another. If these continuances are omitted, the cause is thereby discontinued, and the defendant is discharged out die, without a day, for this term; for by his appearance in court, he has obeyed the command of the king's writ; and, unless he be adjourned over to a day certain, he is no longer bound to attend upon that summons; but he must be warned afresh; and the whole must begin de novo. It may sometimes happen, that after the defendant has pleaded, nay, even after issue or demurrer joined, there may have arisen some new matter, which it is proper for the defendant to plead; as, that the plaintiff, being a femofole, is since married, or that the heir has given the defendant a release, and the like: here, if the defendant takes advantage of this new matter, as early as he possibly can, viz., at the day for his next appearance, he is permitted to plead it in what is called a plea continence, or since the last adjournment. For it would be unjust to exclude him from the benefit of this new defence, which it was not in his power to make when he pleaded the former. But it is dangerous to rely on such a plea, without due consideration; for it confounds the matter which was before in dispute between the parties (Cro. Eliz. 49). And it is not allowed to be put in, if any continuance has intervened between the arling of this fresh matter and the pleading of it; for then the defendant is guilty of neglect or laches, and is supposed to rely on the merits of his former plea. Also it is not allowed after a demurrer is determined, or verdict given; because then relief may be had in another way, namely, by writ of audita querela. And these pleas continence, when brought to a demurrer in law or issue of fact, shall be determined in the same manner with other pleas. Black. Comm. vol. iii.

CONTINUANCES and effusions are amendable upon the roll, at any time before judgment—that is, they are the acts of the court, and at common law they may amend their own acts before judgment, though in another term; but their judgments are only amendable in the same term in which they are given. (3 Lev. 431.). Upon an Original, one term, or two, or three terms may be made between the issue and the return; and this shall be a good continuance for the defendant is not prejudiced by it, and the plaintiff may give a day to the defendant beyond the common day, if he will. But a continuance by capias ought to be made from term to term, and
there cannot be any mens rea term, because the defendant ought not to stay so long in prison. (2 Dauv. Abr. 150.) If a man recover upon demurrer, or by default, &c. and a writ of inquiry of damages is awarded, there ought to be continuance between the first and second judgment, otherwise it will be a discontinuance; for the first is but an award, and not complete, till the second judgment, upon the return of the writ of inquiry of damages. (Ibid. 153.) If the plaintiff be non-suited, by which the defendant is to recover costs; if the plaintiff will not enter his continuances, on purpose to save the costs, the defendant shall be suffered to enter them. (Cro. Jac. 316, 317.) The course of the court of King's Bench is to enter no continuance upon the roll, till after issue or demurrer, and then to enter the continuance of all upon the back, before judgment; and if it is not entered, it is error. (Trin. 16 Jac. B. R.) See Discontinuance.

Continuance of a writ, or action, is its holding in force from one term to another, in a cause where the defendant has not returned, or executed, a former writ issue out in the same action.

Continuance of assize. If a record in the treasury be alleged by one party, and denied by the other, certiorari shall be sued to the treasury and chamberlain of the exchequer; who, if they certify not that the said record is there, or likely to be in the Tower; the king shall then send to the justices, repeating the certificate, and will then to continue the assize.

Continuanda. See Assisa.

Continuando, in Law, a term used in a declaration of trespasses, where a plaintiff would recover damages for several trespasses in the same action. To avoid multiplicity of suits, a man may in one action of trespasses recover damages for many trespasses; laying the first to be done with a continuance to the whole time in which the rest of the trespasses were done; which is done in this form: continuando transfereat in pridem, &c. et predicta die, &c. et alio. See Terms of Law. 2 Roll. Abr. 545. Lord Raym. 24. 7 Mod. 152.) This declaration of trespasses may be alleged, where the inquiry is continually renewed, as by spoiling or consuming the herbage with the defendant's cattle; in which case the continuando is good. (1 Lall. Abr. 307.) Thus also trespass for breaking a house with continuando is good; and until a re-entry is made, the continuation of the possession is a continuing of the trespasses (Lutw. 1312.) But where the trespass is by one or several acts, each of which terminates in itself, and being once done cannot be again done, it cannot be laid with a continuando; yet if there be repeated acts of trespasses committed, (as cutting down a certain number of trees,) they may be laid to be done, not continually, but at divers times and days within a given period. Salk. 635, 639. Lord Raym. 823.

Continuando Processum. See Processum and Continuance.

Continuans Punctum. See Punctum.

Continuation of Motion. See Motion and Projectile.

Continuative Conjunctives, in Grammar, are those conjunctions, uniting both sentences and their meaning, which join those sentences only, which have a natural connection; in contradistinction to copulative, which join all sentences, however incongruous in significations. The latter merely couple sentences, and are applicable to all subjects, whose natures are not incongruous. The former, on the contrary, by more intimate connection, consolidate sentences into one continuous whole, and are therefore applicable only to subjects which have no essential coincidence. The principal copulative in English, is, and; the continuatives are, if, because, therefore, that, &c. E. G. "Lyrip. pus was a flattery, and Plician was a grammarian."—"The sun shineth, because the sky is clear." Continuatives, according to the distribution of Mr. Harris (Hermes, p. 244.) are either suppositive, as, if; or positive, as, because, therefore, &c. E. G. "You will live happily, if you live honestly."—"You will live happily, because you live honestly." The difference between these continuatives is this; the suppositives denote connection, without affording actual existence; and the positives imply both the one and the other. Moreover, positives are either causal, as, because, since, as, &c.; or collective, as therefore, then, &c.; and they differ in this respect, that the causals subjoin causes to effects, thus; "the sun is eclipsed, because the moon intervenes;" but the collectives subjoin effects to causes, thus; "the moon intervenes, therefore the sun is eclipsed." All these continuatives may be resolved into copulative. Instead of "because it is day, it is light," we may say, "it is day, and it is light."

CONTINUATO, in the Italian Musica, is used to direct a finger, or player, to continue or hold on a sound, in equal strength or manner; or to continue a movement in an equal degree of time all the way.

Continued Fever. A fever without remissions or intermissions. See Fever.

Continued Quantity. See Continuum, Continuity, Continued Body. &c. and Quantity.

Continued, or thorough buses, in Musica, is that which continues to play constantly, both during the recitatives, and to sustain the choir, or chorus.

Continued proportion, in Arithmetick, is that in which the consequent of the first ratio is the same with the antecedent of the second: as, 3:6::6:12. See Proportion.

On the contrary, if the consequent of the first ratio be different from the antecedent of the second, the proportion is said to be discrete: as, 3:6::4:8. See Discrete.

Continued scale, or fitches, in Architecture. See Scale.

Continued Artie, Community, Pedalg. See theabantives.

Continui Solution. See Solution.

Continuity is usually defined among Schoolmen, the immediate cohesion of parts in the same quantity. Others define it, a side of body, whereby its extremes become one: and others, a state of body resulting from the mutual implication of its parts.

Continuation relates to duration, and continuity to extension. We say, the continuation of a work, or an action; and the continuity of space or time; continuation of the same conduct; and continuity of the same building.

There are two kinds of continuity, mathematical and phisical. The first is merely imaginary and fictitious; hence it supposes real or physical parts where there are none. Physical continuity is, firstly, that state of two or more parts, or particles, wherein they appear to adhere, or constitute one uninterrupted quantity, or continuum; or between which we perceive no intermediate space.

The Schoolmen distinguish two other sorts of continuity; viz. homogenous, and heterogeneous. The first, where our senses do not perceive the bounds, or extremes, of the parts; and this agrees even to air, water, &c. The second, where our senses indeed perceive the extremes of certain parts, yet at the same time observe the same parts closely linked to each other; either in virtue of their situation or figure, &c.
and this is chiefly attributed to the bodies of animals and plants.

The continuity of bodies is a state merely relative to our sight and touch: e.g., if the distance of two separate objects be such, as that the visual angle they subtend is insensible to the eye, which it will be if less than sixteen seconds, the two separate bodies will then appear contiguous. Now, the result of several contiguous objects, is a continuity: so that any number of visible objects, being placed so as that the distances subtended angles of less than sixteen seconds, they will appear to form one continuum.

And hence, as we can determine the distance at which any given magnitude becomes invisible; it is easy to find at what distance any two bodies, however remote from each other, will appear as contiguous; and several, as forming one continuum. For the physical cause of continuity, see Continuum.

Leibnitz, an eminent mathematician, has supposed what he calls a law of continuity to obtain in the universe, by which all events that are executed or done in nature, is done by infinitely small degrees. He urges, that good enemies dictate this truth, nature non operatur per saeculum; or that nothing can pass from one extreme to another, without passing through all the intermediate degrees. Bernoulli Opera, tom. iii. p. 292.

This law seems subject to difficulties: rigorously taken, it supposes actual, and yet infinitely small changes, which some philosophers cannot admit; and if we suppose changes only perceptible to our senses, finite, the law of continuity is no less violated, than if the universe were to be suddenly destroyed, as M. Maupertuis justly observes. Mem. de l'Acad. de Berlin, tom. ii. p. 284.

This law of continuity led Mr. Bernoulli to reject all hard bodies as chimeras, and naturally impossible. CONTINUUM, in the Italian Music, is sometimes applied to baffo, to signify the thorough-bass. That basso continuo, is the continual, or thorough-bass. It is sometimes marked in music books by the letters B. C.

Continuo is also needed for a species of harmony mentioned by Julius Pollux, and which, says Zarlino, answers to the perpetual burden of our bag-pipes, which now and then must be harmonious.

CONTINUOUS FEVERS. See Continued fever.

CONTINUUM, or Continued quantity, in Physics, denotes a quantity, or co-extension, whose parts are not divided, but joined and connected together, so as to leave no room to determine where one begins, and another ends.

It is controverted, among philosophers, whether a continuum be infinitely divisible, i.e., divisible into infinitely proportionable parts?

The ancients attributed the rife of water, in pumps, to the love of continuity, and the abhorrence of a vacuum; because the weight and presse of the air were not then known.

Mathematicians divide quantity into continued and discrete.

The former being that which is expressed by lines, and makes the subject of geometry; and the latter comprehending those that are expressed by numbers, which make the subject of arithmetic.

In medicine and chirurgery, wounds, ulcers, fractures, &c. are expressed by the pharse soluto continuo, or solution of continuity.

In a critical sense, we say, there ought to be a continuity, i.e., a connexion between the parts of a discourse.

In the epic poem, particularly, the action should have a continuity in the narration, though the events, or incidents, be not continued. As soon as ever the poet has opened his subject, and brought his persons on the stage, the action is to be continued to the end; every character must be at work, and no such thing as an idle person to be seen.

F. Bolis observes, that, by retrenching dull languishing incidents, and intervals void of action, which break the continuity, the poem acquires a continued force, which makes it run equally throughout.

CONTOBABDITES, a sect in the fifth century. Their first leader was Severus of Antioch, who was succeeded by John the grammarian, and named Philoponus; and one Theodorus; whose followers were also called Theodians.

Some of them who were willing to receive a book composed by Theodorus on the Trinity, made a separate body, and were called Contobabdites, from a place not known, which Nicetomus does not mention, but which must apparently have been the place where they held their assemblies.

The Contobabdites allowed of no bishops; which is the only circumstance transmitted to us concerning them.

CONTOOOCOOK, in Geography, a river of the United States of America, in New Hampshire, which runs into the Merrimack, four miles N. of Concord.

CONTOPJECTAE, of nuxxes, pole, and comparis, in Antiquity, a fort of artificers who supported a pole on their foreheads so firmly, that boys could play, dance, and wrestle together on it.

CONTR, or kuntore, in Ornithology. See Concord.

CONTRITION, in Surgery, a twining or deformity of some part of the body; arising generally from a diseased structure of the bones, or an irregular action of the muscles. Thus a contortion of the back may be occasioned by a caries, or a rickety disposition in the vertebrae; and a contortion, or twining of the head, so that the chin shall be turned towards one shoulder, may arise from a paralysis, or a spasmodic state of the Feno-maiafoid muscle. But the nature of this disease is more particularly deferred under the article Distorsion, to which the reader is referred.

CONTRITE, or Contorti, in Botany, the twenty-ninth natural order in the Philosophy Botanica of Linnaeus, and the thirtieth of the Prelections. In the Philosophy Botanica, it consists of the following genera: ranuulosa, tetivita, cerbera, plumiera, tabernemontana, cameraria, periplaca, nerium, vinca, apocynum, cynanchum, ceropogia, alcopias, flapelia. In the synoptic table, annexed to the Prelections, they stand thus 1. Pericarp a follicle; tabernemontana; cameraria; plumiera; echites; nerium; ceropogia; vinca; apocynum; alcopias; cynanchum; periplaca; peregrina; flapelia: *emboithria, Forb. *ephahola, Aubl; *eleotonia; allamanda. II. Pericarp a capulce; macrocemum; manettia; cinchona, removed from cymode; portlandia; rudeleia; hillia; genipa. 111. Pericarp a berry; gardenia; mufitandra; randha; *fagara, Thomb.; carissa; pedesia; arundia; lyccum and cellarium, both removed from videpecule; *gnopogon, Forb. *willughbeja, Schreb.; melodinus, Linum. jun. IV. Pericarp a drupe; ranuulosa; cerbera. Those printed in italics were added by Linneas himself; those marked with an asterisk, by Gicke from other authors. The order was named by Linneas, from the form of the corolla, which is twisted in a direction contrary to the fun: its border, when open, resembles a wheel, each segment having generally unequall sides, with the shorter side placed under the longer side of the preceding one. Only three of the genera are natives of Europe, alcopias, vinca, and cynanchum: most of them are lacteet and poifoonous;
some highly deleterious. Root perennial. Leaves undivided, generally opposite, sometimes three or four together, rarely alternate. Inflorescence of ten singular, the peduncle arising from the side of the stem between the pairs of leaves, not from their axils. Calyx one-seated, five-cleft. Corolla regular, monopetalous, five-cleft: structure of the stamens in most genera very singular. Stamens five. Filaments two, or one with a double stigma. Germ generally superior.

CONTOUR, in Painting or Drawing, a French word, synonymous with contour, in the Italian, and outline in the English language. Perfection of outline constitutes, perhaps, the greatest difficulty in painting; although it is, properly speaking, only one of the requisites of design; yet the knowledge of it seems necessarily to precede a thorough acquaintance with all the remainder; and hence the adage of Annibale Caracci, not very delicately expressed in the Italian, “Give me but a correct outline, and fill it up as you please!” See Dessin.

Contour, also denotes compass, limits, or enceinte of a country, place, camp, plan, design, &c. It is the ground work of each of these things.

CONTOURNE, a French term applied to any animal that is flanding or pafting with its face towards the fimler side of the escutcheon. In English heraldry it is termed counter foallant.

CONTOURNATED, or CONTORNATED, a term applied among Antiquaries to a species of medals, so caled from the Italian contornato, encircled, on account of the hollow circle which commonly runs round them. They are distinguished from medallions, as they are sometimes denominated, not by their size, but by their thinness; faint relief; reverses sometimes in integlo, hollowed, not raised; and, in general, by their peculiar and inferior workmanship. Medallion writers have formed various opinions concerning these singular pieces of coinage. Some suppose that they were struck by Gallienus, to the memory of illustrious men, and celebrated athletes, at the time when he caused all the confectioners of his predecessors to be restored. This sentiment seems nearly to have been adopted by M. Mahudel, who says, (Hist. de l’Acad. des Belles Lettres, tom. v. p. 204.) that the contornati were struck originally at Rome, about the close of the third century. F. Hardouin conjectures, that they were not earlier than the 13th century; other antiquaries refer them to the fifth century; and others find instances of them as ancient as the time of Nero; others again attribute the invention of them to Greece, in her days of glory, and suppose that they were appropriated to the purpose of honouring the histories of great men, and principally of those who had borne away the prize at the solemn games; such are those which bear the names or images of Homer, Solon, Enclid, Pythagoras, Socrates, Apollonius Tyanaeus, and several Athletes, whose victories are expressed upon them by palms, and chariots, either biga or quadriga. Havercamp, in an express work on these pieces, thinks they were struck from the times of Constantine I. to those of Valentinian III. on account of the public games. Mr. Pinkerton (Hist. of Medals, vol. i. p. 232.) fuggles, that they were tickets for different places in the public games. The dye, appearance, device, inscription of the reverse—everything—confirmed this opinion; which he has found perfectly cononant to that of two or three of the first medallists in this country. This opinion is so far conformable to that of Havercamp, and others, that it supposes that these pieces were struck upon occasion of the games. But it differs in representing these medals, as mere tickets for places at the games; and still more in supposing them struck in all ages of the empire, from Augustus, downwards. Those who suppose them struck in the lower empire, are reduced to the deplorable dilemma of imagining, that Christian princes thought Nero’s head an honour to their games; and that they preferred the portrait of Apollonius Tyanaeus, the enemy of their faith, and those of other Pagan philosophers. Joubert indeed ascribes them to the upper empire, without determining whether they were struck under one prince, or all who gave games. Mr. Pinkerton is convinced, that they were struck under the various emperors whose names they bear; and that when Constantine I. introduced Christianity, they would almost vanish, instead of beginning, according to the opinion of Havercamp. The difference of workmanship, in these pieces, if accurately inspected, may give this of itself, independently of other reasons. Although these pieces are of different kinds, they are mostly of a size between two and three inches in diameter. Some have, upon the obverse part, the head of the emperor or empress, who gave the games; and almost a series of them might be formed from Augustus down to Gallienus. In confirmation of this opinion, it is further alleged, that those emperors, who were remarkably distinguished by their attachment to public diversions, occur very frequently on these pieces, which Mr. Pinkerton calls “ticket-medals,” whereas others appear more seldom, and those who never presented any games, not at all. Those with Nero on their obverses are so common as to be of very little value. Other obverses prefer the portraits of illustrious authors of antiquity, that are no where else to be found. Sallust, Horace, and other Roman writers, were delineated on these tickets, when the memory of their persons was yet fresh to the inhabitants of Rome, and we may therefore depend upon their portraits. This cannot be said of the Greek portraits of Homer, Solon, Pythagoras, Socrates, and others, all which our author supposes to have been struck at Rome, when Greek actors were to perform, or in the Greek cities, during the Roman empire. A few obverses present athletes, or actors in the games, and such are commonly represented holding a horse by the rein, or in some other attitude peculiar to their profession. On the reverses there is almost always a charioteer driving a chariot, or some similar device, peculiar to public games. Those struck for the theatre are the most scarce, and have sometimes on the reverse an actor at full length, with “Plaees,” “maggis tbe plaees,” or some such legend. One, in particular, has a bust of Sallust on the obverse, and on the other side three persons, one of whom bears an instrument, resembling the common flute; another an instrument like the scenic flute seen in the hands of Pan; while the third is declaring, “The legend is” “Petroni Places,” maggi thou plaes, Petronius. The person declaring is Petronius, who was, perhaps, that day, to make his first appearance upon the Roman stage; and the whole design, in this last instance, is so clear, that Mr. Pinkerton cannot forbear being surprised, that the intention of these tickets should so long have escaped the medallist authors. The supposition that they were tickets for different seats, or places, at the games, is further confirmed by the variety of marks to be found on the obverses of them. Some have a sprig of laurel; others a P, with an E below it, implying, perhaps, “pudium equiitare,” or the box of the equestrian order, which is very common; others bear a particular animal, or some such badge. All these marks, in tickets perfectly preserved, are cut in the brass, and then filled up with silver. The pieces of this class, with imperial portraits, are of little value; those bearing the images of illustrious men, are estimable, though not of great price. Apollonius Tyanaeus, who flourished in the reign of Domitian, and Apuleius, who lived in that of Antoninus the philosopher, are it believed, the latest
CONTRA, or Counter, in Composition. See Counter.

CONTRA, Lat. a preposition frequently used by the Italians in their Mixt: contrappunto, countertext; contra basso, double base; contralti, counter tenor; contrappunto doppia, double counterpoint; contrapporto semplice, simple counterpoint; contrappunto fiorito, fluid counterpoint, &c.

This Latin word, which the Italians have adopted, was originally applied to all the several parts defined to make harmony to a plain song or melody, as counterpoints or counterparts to the canto fermo. Thus, harmony in four and more parts was formed; as a basso, base; medius, mean or middle part; alto tenore, high tenor, from the situation of the clef on the staff; the disponent, sopran, treble, &c. When the alto tenor sung the part opposite or against the treble, it was called contralto or counter tenor; and when a lower part was employed than the base, it was called contra basso; the title now given to a double base.

CONTRA, in Surgery. See Counter-silence, Counter-extension, Counter-opening, Counter-stroke, &c.

Contra battuta, in Music, against, or out of time.

Contra fornem collationis, in Laws, a writ that lay where a man had given lands, in perpetual aims, to a religious house, hospital, school, or the like, and the governor, or managers, had alienated the lands, contrary to the intention of the donor, for the recovery of them. Reg. Orig. 258.

This was founded on the statute of Welfam. 2 cap. 1.

Contra fornum servitum, a writ that lay for the heir of a tenant, infodified of lands or tenements by the lord's charter, to make certain suit and service to his court; who was afterwards disfrained for more services than were contained in the charter. Reg. Orig. 176. Old Nat. B. ii. 162.

Contra fornum statuti, is the usual conclusion of every indictment, &c. laid on an offence created by statute.

If one statute be relative to another, as where the former makes the offence, and the latter adds a penalty, the indictment ought to conclude contra fornum statutorum. 2 Hale's Pl. C. 173. c. 24. Where there are several statutes, and it does not appear on which the information is founded, the conclusion, 'contra fornum statuti' is ill. Cro. Jac. 142. Pl. 19. Broughton v. Moor, &c.

CONTRABAND, in Commerce, a prohibited commodity; or a merchandise bought or sold, imported or exported, in prejudice, and contrary to the laws and ordinances of a state, or the public prohibitions of the sovereign.

The word comes from the Italian contrabando, of contra and bands, q. d. contrary to edict, or publication of prohibition.

Contraband goods are not only liable to confiscation themselves, but do also subject all other allowed merchandise found with them in the same box, parcel, or bale, together with the horfes, waggons, &c. which conduct them to the same.

In England there are two principal contrabands for exportation, wool and live sheep, which all strangers are prohibited from carrying out, on pain of having the right hand cut off; the other, that of sheep-skins and calf-skins, which all foreigners are in like manner prohibited from exporting, on pain also of having the right hand cut off; yet the subjects of England are allowed to transport the same from France to England. See Wool and Sheep.

Since the year 1652, when lists were formed of contraband goods, as to the import, and which included more than fifty different sorts, many regulations and statutes have been enacted; and these are so numerous and various, and so liable to change in the fluctuating state of commerce, that in a work of this kind it would be of little permanent utility to recite them.

In 1719 and 1720, an attempt was made in parliament to pass a bill for putting gold and silver, whether in coined species, or otherwise, among the number of contraband goods for exportation; but in vain, by reason of the strong opposition made by those who enrich themselves by the export of these metals; which, by the laws of the kingdom, are allowed to be sent away, upon entering them, paying the duty of the export, and making oath of their being foreign goods. Of this sort none being the coin or plate of the kingdom, melted down. See Customs.

CONTRACT, a mutual content of two or more parties, who promise and oblige themselves voluntarily, to do something, pay a certain sum, or the like.

As a contract is a mutual promise, the obligation of contracts, the f esse in which they are to be interpreted, and the cases where they are not binding, will be the same as of promises. See Promise. From the principle on which the obligation of promises is founded, viz. "that this obligation is to be measured by the expectation which the promisor any how voluntarily and knowingly excites," results a rule, which governs the construction of all contracts, and is capable, from its simplicity, of being applied with great ease and certainty: the rule is, that "whatever is expected by one side, and known to be so expected by the other, is to be deemed a part or condition of the contract." The several kinds of contracts may be comprehended under those of sale, hazard, loan of inconvertible property and money, and labour, including service, commissions, partnership, and the like. With regard to contracts of sale, the rule of justice, which ought principally to be inculcated in the making of bargains, is, that the seller is bound in confidence to disclose the faults of what he offers to sale. If it be deemed dishonour to magnify beyond the truth the good qualities of the commodity which we have to sell, is it less unjust to conceal its faults? The buyer in many cases has no security from impostion, but in the ingenuousness and integrity of the seller. This rule, however, admits of one exception, namely, where the silence of the seller implies some fault in the thing to be sold, and where the buyer has a compensation in the price for the risk which he runs: as where a horfe, in a London repository, is sold by public auction, without warranty; the want of warranty is notice of some unfoundness, and produces a proportional abatement in the price. (See Warranty.) To this head of concealing the faults of the article which we want to dispose of may be referred the practice of passing bad money. This practice has been sometimes defended by a vulgar excuse, that we have taken the money for good, and must therefore get rid of it: that is, in other words, we have been deceived, or imposed upon, but it may decay, or impose upon others. This excuse is much the same, as if one, who had been robbed upon the highway, should allege that he had a right to re-imburse himself out of the pocket of the first traveller he met: the justice of which reasoning the traveller possibly may not comprehend. (See Uttering of false money.) Where no monopoly or combination exists, the market price is always a fair price; because it will always be proportionable to the use and scarcity of the article. Innumerable questions relating to this kind of contract are determined solely by custom; not, indeed, that custom professes any proper authority to alter or avert the nature of right and wrong; but because the contracting parties are proufed
prefumed to include, in their stipulation, all the conditions which custom has annexed to contracts of the same sort; and when the usage is notorious, and no exception made to it, this presumption is generally agreeable to the fact. Thus, in justice as well as in law, what is called "the custom of merchants" regulates the construction of mercantile contracts.

By contracts of hazard are meant gaming and insurance. See those articles.

Contracts of loan comprehend those pertaining to inconsumable property, and to money. When the identical loan is to be returned, as a book, a horse, &c. it is called "inconsumable," in opposition to corn, wine, money, and those things which perish, or are parted with in the use, and can therefore only be restored in kind. The questions pertaining to this class of contracts are few and simple, and admit of an easy and obvious solution. If the thing lent be lost, or damaged by the use, or by accident in the use for which it was lent, the lender ought to bear the loss or damage. With regard to the loan of money, there exists no reason in the law of nature, why a man should not be paid for the use of his money lent, as well as of any other property into which the money might be converted. (See Interest and Usury.) For contracts of labour, see Servant, Commission, Agent, Factor, Steward, Attorney, and Advocate. See also Partnership. Under this head it may be observed, that in many offices, as schools, fellowships of colleges, professorships of the universities, and the like, there is a two-fold contract; one with the founder, and the other with the electors. The contract with the founder obliges the incumbent of the office to discharge every duty appointed by the charter, duties, deeds of gift, or will of the founder; because the endowment was given, and consequentially accepted, for that purpose, and upon those conditions. The contract with the electors extends this obligation to all duties that have been customarily connected with, and reckoned a part of, the office, though not preferred by the founder; for the electors expect from the person they choose all the duties which his predecessors have discharged; and as the person elected cannot be ignorant of their expectation, if he mean to refuse this condition, he ought to apprise them of his objection. Here it should be observed, that the electors can excuse the confidence of the person elected from this class of duties only; because this class results from a contract, to which the electors and the person elected are the only parties. The other class of duties results from a different contract; and with respect to the latter a question arises of delicate investigation, and of difficult solution, viz. how far the incumbent of an office may be allowed to deviate from the will of the founder, and to supplant him placed in circumstances similar to his own, and, in this new state of things, capable of forming a different judgment, and equally disposed to adapt his regulations and injunctions to the change of circumstances, which, in the course of ages, has occurred?—The best mode of curing the confidences of incumbents, in cases of this kind, is to introduce a reformation in many antiquated establishments, and in the laws, already obsolete, and, as it were, quenchless, by which they were designed by their unenlightened, but liberally disposed, founders to be regulated. Few of these contracts, to which we now refer, have, we conceive, been liberally and punctually fulfilled in modern times; and it would be unquestionably more conducive to the honour and welfare of ancient institutions, and of official incumbents, to establish regulations, which it is not thought proper to observe. It has been a question of some magnitude and difficulty, what offices may be constitutionally supplied by a deputy. A deputy, according to archdeacon Paley, may be allowed in all cases, to which the following objections do not apply: 1. Where a particular confidence is reposed in the judgment and contract of the person appointed to it; as the office of a rector, guardian, judge, commander in chief by land or sea. 2. Where the custom binds; as in the case of schoolmasters, tutors, and of commissioners in the army or navy. Where the duty cannot, from its nature, be so well performed by a deputy; as the deputy-governor of a province may not profess the legal authority, or the actual influence of his principal. 4. When some inconvenience would result to the service in general from the permission of deputies in such cases; e.g. it is probable that military merit would be much discouraged, if the duties belonging to commissions in the army were generally allowed to be executed by subordinates. In this connection, the non-residence of the parochial clergy, who supply the duty of their benefices by curates, presents itself to consideration; but as it will require a more distinct discussion, we refer to the article Non-residence. On the subject of this article, see Paley's Principles of Moral and Political Philosophy, vol. i. p. 142—163.

Contract is particularly used in Common Law, for an agreement or covenant between two or more persons, with a lawful consideration or cause. As, if I sell my horse for money; or covenant in consideration of 20l. to make you a lease of a farm; these are good contracts, because there is "quid pro quo," or one thing for another. Or, a contract which usually conveys an interest merely in action, may be thus defined: "An agreement upon sufficient consideration, to do or not to do a particular thing." In all contracts, therefore, our attention is directed to three points, viz. the agreement, the consideration, and the thing to be done or omitted, or the different species of contracts. In a contract, considered as an agreement, a mutual bargain, or convention, there must be at least two contracting parties, of sufficient abilities to make a contract, as where A. contracts with B. to pay him 10l., and thereby transfers a property in such sum to B. This property, however, is not in possession, but in action merely, and recoverable by suit at law; so that it could not be transferred to another person by the strict rules of the ancient common law, for no chose in action could be assigned or granted over. See Choice in Action.

This contract or agreement may be either express or implied. Express contracts are where the terms of the agreement are openly uttered and avowed at the time of the making, to deliver an ox, or ten load of timber, or to pay a stated price for certain goods. Implied are such as reason and justice dictate, and which, therefore, the law presumes that every man undertakes to perform. There is one species of implied contract, which runs through and is annexed to all other contracts, conditions, and covenants, viz. that if I fail in my part of the agreement, I shall pay the other party such damages as he has sustained by such neglect or refusal. In short, almost all the rights of personal property (when not in actual possession), do in great measure depend upon contracts of one kind or other, or at least might be reduced under some of them; and this is the method taken by the civil law, which has referred the greatest part of the duties and rights, of which it treats, to the head of obligations ex contractis, and quasi ex contractu. (Inst. 3. 14. 2.) See Assumpsit.

A contract may also be either executed, as if A. agree to change horses with B., and they do it immediately; in which case the possession and the right are transferred together;—or it may be executory, as if they agree to change next
next week; in which case the right only vellis, and their
reciprocal property in each other’s horse is not in possi
dition but in action:—for a contract executed (which differs nothing
from a grant) conveys a chose in possession; a contract execut-
tory conveys only a chose in action. For an account of the
consideration, upon which a contract is founded, see Consi-
deration.

A consideration of some sort or other is absolutely ne-
cessary to the forming of a contract, that a nudum pactum, or
agreement to do or pay any thing on one side, without any
compensation on the other, is totally void in law, and a man
cannot be compelled to perform it. However a man may
or may not be bound to perform such a contract, in honour
or confidence, which the municipal laws do not decide, it is
certain that these laws will not compel the execution of what
he has no visible inducement to engage for;—and, therefore,
our law has adopted the maxim of the civil law, that ex
nudis pactis non oritur actio. (Cod. 2. 3. 10. & 5. 1. 1. Br. &
St. d. 3. c. 24. Bro. Abr. tit. de te. 179. Salk. 129.) But any
degree of reciprocity will prevent the pact from being made:
nay, even if the thing be founded in a prior moral obliga-
tion, (as a promise to pay a just debt, though barred by
the statute of limitations,) it is no longer nudum pactum. And
as this rule was principally established to avoid the inconve-
nience that would arise from setting up mere verbal pro-
mises, for which no good reason could be assigned (Plowd.
308. 309,) it therefore does not hold in some cases, where
such promise is authentically proved by written documents.
For if a man enters into a voluntary bond, or gives a prom-
issory note, he shall not be allowed to aver the want of a con-
sideration in order to evade the payment; for every bond,
from the solemnity of the instrument (Hardr. 200. 1. Ch.
Rep. 157,) and every note from the subscripation of the
drawer (Lord Raym. 760,) carries with it an internal evi-
dence of a good consideration. Courts of justice will, there-
fore, support them both, as against the contractor himself;
but not to the prejudice of creditors, or Rangres to the
contract.

The most usual contracts, by which the rights of chattels
personal may be acquired, by the laws of England, are those
of sale or exchange, of bailment, of hiring and borrowing, and
of debt. See these articles respectively. See also Interest
and USURY, Bottomry and Respondentia, INSUR-
ANCE, and ANNUITY.

Every contract, whatever be its nature, implies in itself
an assumpst in law, for the performance of its; for a contract
would be to no purpose, if there were no means to enforce
its performance. See ASSUMPTION.

A dexterity occurs where a day of payment is limited in
a contract, and where it is not so limited. In the former
case, the contract is good prefixed, and an action lies upon
it, without payment; but in the latter, it is otherwise.
Thus, if a man buy any commodity, the contract is void, if
he do not pay the money prefixed; but if a day of pay-
ment be stipulated, there the one may have an action for the
money, and the other trover for the commodity. (Dyer, 52.
293.) Where a seller fays to a buyer, he will sell his horse
for a fixed sum, and the buyer fays he will give it: if he
prefently tell out the money, it is a contract; but if he do
not, it is no contract. (Noy’s Max. 67. Hab. 41.) The prop-
erty of any thing foid is immediately in the buyer by the
contract; though regularly it must be delivered to the buyer,
before the feller can bring his action for the money. (Noy.
88.) If a perfon contract to buy a horfe, or any thing elfe,
of another, and no money is paid, or earnest given, nor day
set for payment, nor thing delivered; in these cases, no
action will lie for the money, or the thing sold, but it may
be sold to another. (Plowd. 128. 509.) A11 contracts are
to be certain and complete. For an agreement to give fo
much for a thing as it should be reasonably worth, is void
on account of its uncertainty; fo is also a promise to pay
money in a short time, &c. or to give fo much, if a perfon
likes the thing when it begins to sell. (Dyer, 91. 1. Build. 92.)
But if a contract to give another 10l. for such a thing, if I like it
on seeing the thing, this bargain is said to be perfect at my
pleasure, though I may not take the thing before I have
paid the money:—if I do, the seller may have trepals againat
me: and if he sell it to another, I may bring an action on
the cafe against him. (Noy, 104.) If a contract be to have
for cattle sold, if the buyer do a certain thing, or else
to have 20l. it is a good, and sufficiently certain contract.
Halo, if I agree with a perfon to give him fo much for his
horse, as A. B. mall judge him to be worth, when he hath
judged it, the contract is complete, and an action will lie
on it; and the buyer shall have a reasonable time to demand
the judgment of A. B. But if he die before the judgment is
given, the contract is determined. (Perk. sect, 112. 114.
Slep. Ab. 294.) In contracts, the time is to be regarded,
and from which the contract is made; the words shall be
taken in the common and usual sense; and the law doth not
so much regard the form of words, as the substance, and the
mind of the contracting parties. (5 Rep. 83. 1. Build. 175.)
A contract for goods may as well be made by word of mouth,
as by deed in writing; and where it is merely written, but
not sealed and delivered, it is the same as if it were verbal.
But if the contract be by writing sealed and delivered,
and so converted into a deed, it is of another nature; and in this
case generally the action on the verbal contract is gone,
and some other action lies for the breach of it. (Plowd. 130. 309.
Dyer, 96.) Contracts, not to be performed in a year, are to
be in writing, signed by the party, &c., or no action may be
brought on them; but if no day is set or the time is uncer-
tain, they may be good without it. (Sta. 20 Car. II. c. 2.)
And by the same statute, no contract for the sale of goods
for 10l. or upwards, shall be good, unless the buyer receive
part of the goods sold, or give something in earnest to bind
the contract; or some note thereof be made in writing, signed
by the perfon charged with the contract. See SALE.

Consult. nude and quafi. See the adjectives, and

Consult. Simple. See SIMPLE and Debt.

Consult. Special. See SPECI ALTY and Debt.

Consult. Usurious, is a contract to pay more interest for
money than the laws allow.

It is a devavit in executors to pay a debt upon an ulu-
rious contract. See Usury.

Consult. of Marriage. The Romanists distinguish the

civil contract, which is the consent of the parties, from the

ingrement, which is the blessing of the priest.

These contracts are said to be null, which the law prohib-
its: such are all contracts between persons incapable of con-
tracting, as minors, religious, lunatics, wives without consent
of their husbands, &c.

In order to a good civil marriage, the parties must not
only be willing and able to contract, but actually must con-
tract themselves in due form of law. Any contract made,
per verba de praefenti, or in words of the present tense, and in
case of cohabitation per verba de futuro afo, between persons
able to contract, was before the act (26 Geo. II. c. 23,) deemed
a valid marriage to many purposes; and the parties might
be compelled in the spiritual courts to celebrate it in facie
ecclesiae. But these verbal contracts are now of no force, to
compel a future marriage. See Marriage.
Contract, Original, in English History, denotes that reciprocity of protection and subjection, which subsists between the king of Great Britain and his subjects. The duties resulting from these are what, according to judge Blackstone, (Comm. vol. 1) were meant by the convention in 1688, when they declared that king James had broken the "original contract" between king and people. But however, as the terms of that original contract were in some measure disputed, being alleged to exist principally in theory, and to be only deducible by reason and the rules of natural law; in which deduction different understandings might very considerably differ; it was, after the revolution, judged proper to declare these duties expressly, and to reduce that contract to a plain certainty. So that, whatever doubts might be formerly raised by weak and scrupulous minds about the existence of such an original contract, they must now entirely cease, especially with regard to every prince, who hath reigned since the year 1688. As to the terms of the original contract between king and people, the learned judge apprehends to be now couched in the coronation oath; which see also Constitution and King.

Contract is also used for the instrument in writing, which serves as a proof of the consent granted, and the obligation passed between the parties.

Among the ancient Romans, contracts, and all voluntary acts, were written, either by the parties themselves, or by one of the witnesses, or by a domestic secretary of one of the parties, whom they call a notary; but who was no public person, as among us.

The contract, when finished, was carried to a magistrate, who gave it a public authority by receiving it inter alia, into the number of the acts under his jurisdiction; giving each of the parties a copy thereof, and sealed with his seal. Which practice passed into France, where it obtained a long time. The conscientious performance of private contracts between man and man is frequently recommended in the Koran. For the prevention of disputes, all contracts are directed to be made before witnesses, and in case such contracts are not immediately executed, the same ought to be reduced into writing in the presence of at least two witnesses, (which seems to have been also required by the Jewish law, even in cases where it was not concerned) who ought to be Males and of the male sex; but if two men cannot be conveniently had, then one man and two women may suffice. The same method is also directed to be taken for the security of debts to be paid at a future day; and where a writer is not to be found, pledges are to be taken. Hence, if people trust one another without writing, witnesses, or pledge, the party on whom the demand is made is always acquitted if he denies the charge on oath, and swears that he owes the plaintiff nothing, unless the contrary be proved by very convincing circumstances. Sale's Koran, Intro. p. 139.

Contracts, in Rhetoric, furnish one head or clas of external arguments. (See Argument and Topics.) In this view of them, they are either public or private. Public contracts denote transactions between different states, as leagues, alliances, and the like; which depend on the laws of nations. Those are called private, which relate to less bodies, or societies of men, and single persons, and they may be either written or verbal. With respect to the force and obligation of contracts, the Roman law declares, that "nothing can be more agreeable to human faith, than that persons should stand to their agreements." Therefore in controversies relating to this kind of human testimony, the party, whose interest it is, that the contract should be maintained, will plead, that such covenants have the force of private laws, and ought religiously to be observed, since the common affairs of mankind are transacted in that manner; and therefore to violate them is to destroy all commerce and society among men. On the other side it may be said, that justice and equity are chiefly to be regarded, which are immutable; and besides, that the public laws are the common rule to determine such differences, which are designed to redress those, who are aggrieved. Indeed, where a compact has been obtained by force or fraud, it is in itself void, and has not effect either in law or reason. But on the other hand, the Roman lawyers seem to have very rightly determined, that all such obligations, as are founded in natural equity, though not binding by national laws, and are therefore called "nuda pacta," ought however in consequence and honour to be performed.

Contracted Vein, in Hydraulics, (Venæ contractæ of Newton,) is a name given to the contraction which has been observed in a stream of fluid leaving out of an aperture. When water, or other fluid analogous to water, issues out of an aperture in the thin side or bottom of a vessel containing that fluid, as at A, fig. 1 and 2. Plate I. Hydraulics, the size of the aperture being very small in proportion to the side or bottom of the vessel, the stream A B is not of the same shape throughout its whole length, nor is it of an uniform size. When the aperture is circular, the distance of the narrowest part of the stream, from the inside surface of the vessel, is about equal to the radius of the aperture. This narrowest part of the stream has been called the contracted vein; the whole stream itself having been usually designated the vein of fluid, by writers on the subject. From the place of the contracted vein forwards, the stream enlarges its dimensions, and sometimes divides itself into different smaller streams. The diameter of the contracted vein, or narrowest part of the stream, is subject to a little variation, arising from the size of the vessel in proportion to the aperture, and partly from the charge of the vessel, (viz. from the height of fluid in the vessel above the level of the aperture); hence the diameter of the contracted vein, as measured by different authors, has not turned out exactly of one invariable dimension; the difference, however, is not very material; as appears from the following table, which contains the different measurements of the contracted vein; calling the diameter of the circular aperture one.

<table>
<thead>
<tr>
<th>Authors of the experiments.</th>
<th>Diameter of the contracted vein.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poleni (de Castellis, § 35.)</td>
<td>0.790</td>
</tr>
<tr>
<td>Michelotti; Sperim. Idraul. tom. II. Exp. 4.</td>
<td>0.806</td>
</tr>
<tr>
<td>Boffa (Hydrom. art. 457. Exp. 5.)</td>
<td>0.818</td>
</tr>
<tr>
<td>Venturi, with 35 inches charge, and an horizontal circular orifice of 18 lines in diameter</td>
<td>0.798</td>
</tr>
</tbody>
</table>

From a mean of the above measurements, it may be concluded, that the diameter of the contracted vein is little more than eight-tenths of the diameter of the aperture. That short part of the stream which flows between the aperture and the greatest contraction, is not uniformly conical, but it approaches to the figure of an hyperbolic conoid.

This contraction of the stream is undoubtedly owing to the different directions, and different velocities, with which the various parts (or, as they are called, filamente) of the fluid are not exposed to the aperture, as is indicated by the fig. 1 and 2. Hence it has been observed, that when the aperture is very large in proportion to the size of the vessel, the contraction of the stream is less evident. And such, also, is in great measure the case, when the side of the vessel in which the aperture is made, is not very thin.
The various filaments of the fluid, which run from every part of the vessel in oblique directions towards the aperture, partly cross each other at the contracted vein; and this crossing, or tendency to cross, is one of the causes which enlarge the stream beyond that place. It is evident, that with apertures of different shapes, the form of the contracted vein, that is of the stream of that place, must vary considerably. But professur Venturi, dextrous in determining the effects of some of those variations from the circular shape, made the following experiments with orifices of peculiar shapes.

"In the orifice A B C D, (fig. 3.) the two sides A, B, are parallel to the horizon; the extremities are rounded; the width of this aperture is less than two lines, its length 18 lines, and the charge 35 inches. The section of the stream which issues from this orifice, first assumes the form E F, after which, the two extremities, E, F, approaching nearer and nearer to enlarge the middle part of the section of the stream, at 45 inches distance from the orifice, acquire the quadrangular form G H. The stream afterwards extends itself in the perpendicular direction, in the form of a large fan K L. I have repeated the experiment, by placing the longitudinal axis of the orifice C D vertically. In this case the same phenomena were produced, E F becoming vertical, and K L horizontal, both preferring their form."

The fluid filaments, which, issuing out of the orifice, pass near the two opposite borders A, B, are very near each other, and becoming convergent, they tend to unite at a very short distance from the orifice itself. The filaments C, D, are more remote, and, perhaps, less convergent; they cannot unite but at a greater distance than the two former. In this case, therefore, there are movements which tend to form two contractions, the one nearer, and the other more remote from the orifice; these two contractions counter balance each other in part. Their mutual opposition carries the effect, G H, to a distance five times greater than that of the contracted vein of a circular orifice, having a diameter of the same breadth as that of this orifice."

"In this experiment we see the cause of a phenomenon, which has been observed in some particular cases by Poleni and others, without giving the explanation. In very orifices of a right-lined figure through a thin plate, the angles of the contracted vein answer to the sides of the orifice and the contrary. When the quadrangular orifice has the situation M N O P, the greatest contraction of the stream is made at a greater distance than in a circular aperture; it assumes the form and situation Q R S T. The reason is, that the opposite angles M, P, are more remote from each other, than the sides I, V, whence the same thing happens as in the long orifice A C B D. In the same manner, the triangular orifice in the situation X, produces a contraction of the form, and in the situation Z, &c."

When the horizontal oblong aperture, C D, (fig. 3.) was used, the distance of the contracted vein from that orifice, was found to vary with the height of the fluid; as shown in the following table; from which it appears, that the contraction of the stream takes place at a greater distance, under strong charges, than in those which have but little elevation.

<table>
<thead>
<tr>
<th>Height of the charge above orifice C D.</th>
<th>Distance of the greatest contraction G H.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inches.</td>
<td>Lines.</td>
</tr>
<tr>
<td>32.5</td>
<td>53.</td>
</tr>
<tr>
<td>18</td>
<td>48.</td>
</tr>
<tr>
<td>10</td>
<td>40.</td>
</tr>
<tr>
<td>6</td>
<td>36.</td>
</tr>
</tbody>
</table>

If a cylindrical tube be fitted to a circular aperture in the side of the reservoir, or vessel containing the fluid, and part of it be pulled into the interior part of that vessel, the contraction of the vein will be greater, and the quantity of fluid that runs out in a given time, will be less, than without such tube. If to the external part of the circular orifice, a short tube be adapted exactly of the shape of the contracted vein, or very nearly so, as in fig. 4, (it being a tube nearly conical, but with its sides a little convex inwardly,) the quantity of fluid that runs out in a given time, will be the same, or very nearly the same, as when the simple aperture is used, without such tube.

The velocity of the fluid is far from being the same in every part of the stream; for since the quantity of fluid multiplies pass through every transverse section of the stream in a given time, it follows, that the velocity must be inversely as the area of each transverse section. Therefore the velocity at the contracted vein is greater than at the circular aperture; and since the areas of the sections at those two places, are as the squares of their diameters, and the diameter of the contracted vein is to that of the circular aperture nearly as eight to ten, or as four to five; hence we may, as 16 is to 25, so is the velocity at the aperture, which we shall call one, to the velocity at the vein contracted; that is, as one to 1.56.

CONTRACTILE Force, that property, or power, inherent in certain bodies, whereby, when extended, they are enabled to draw themselves up again to their former dimensions. For the cause of this property, which is of the utmost consequence to a right understanding of the animal economy, see FIBRIS.

CONTRACTION, in Surgery, from con-tract, to draw together; a rigid or diffused state of any part in the body, but especially of the joints. This rigidity may arise from a morbid condition, either of the bones, ligaments, or muscles; and may proceed from a great variety of causes. Cullen has given four species of contractions; but Sauvages has multiplied them to the number of eleven! The surgeon who knows the cause and seat of this complaint, will not, however, pay much regard to those nosological distinctions, in the method of cure. If the morbid change arises from inflammation and thickening of the parts affected, he will use diuretic remedies, fevertaments, and emollient poultices; or, after the inflammatory state has subsided, he will employ electricity, friction, simulant embrocations, and moderate extension of the affected muscles, &c. If the rigidity be very obstinate, and the ligaments yield with great difficulty, the surgeon will use mechanical force more freely, and perhaps will enjoin the exercise of alternate bending and straightening the limb, by means of pulleys or flex springs, besides the occasional administration of the vapour-bath, or hot applications. The principles of the art being understood, and the nature of the office which comes before us, it will not be difficult, by steady perseverance, to overcome a great number of obstacles which present themselves, in the treatment of contractions.

When the disease is occasioned by an union of the bones which form a joint, the mobility of the limb is not to be expected. This species of contraction is named ankylosis, and is explained at large in a separate article of this work. (See ANKYLOSIS.) When one muscle is found in a state of permanent contraction, e.g. the sternomastoid of the neck, it is sometimes requisite to divide the muscle in order to effect the cure. (See DISTORTION OF THE NECK.) We understand that Mr. Carpe, surgeon of his majesty's forces, has invented many ingenious mechanical instruments, which will soon be made public, for the relief of this class of discares.
**Contraction**, in Grammar, the reduction of two vowels, or syllables, into one; as, 

- may, for may not; 
- should, for should not.

The Greeks abound with contractions, both in their verbs and their nouns.

In this language, two simple vowels concurring in the same word are generally combined into a diphthong; and in this case the concurrent vowels are said to be contracted.

Contraction is either simple or compounded; simple, when constituent vowels are retained unchanged; and compounded, when a new sound results. E.G. The contraction of τοὐχιμι into τοὐχι is simple; that of τωξιμιος into τωξιμιος is compounded. The first fort of contractions is called synecdsis, the second *crasis*.

When two succeeeding vowels have dots above them, they are separately sounded; but when contracted, they have over them the circumflex accent; hence τοὐξιμι has three syllables, but τοξιμι only two.

Every contraction, whether simple or compounded, is the coalition of two short vowels; and it takes place in nouns of every declension, in adjectives, in verbs, and in the combination of the article and prepositions with the succeeding words. Simple contractions are all reducible to the following rule.—Let the concurreing vowels, instead of being separated, be expressed by a single impulse of the voice; as ιο, αυ, αυ, ιν, &c. The difficulty lies in the compounded contractions; but all the varieties of these may be comprehended under the four succeeding cases.

1. If the two short vowels to be contracted be the same, they have already represented by one of them lengthened. Thus κα, κα, κα, are contracted into κα, κα, κα, respectively. Note, however, that, in the common tongue, the contraction of κα is not into κα, but into κα.

2. If the concurrent vowels be not the same, which is predominant in sound prevails over that which is subordinatet to it. The predominant vowel must in most inances be the prepositive; hence this preoccupies the organ, and thus demands a fuller enunciation. The subjunctive, therefore, is lost in the contraction; and its only effect is to length the prepositive, when a *doubtful* vowel, but to convert it, if faint by nature, into its correspondent long one. Hence κα, κα, κα, and κα are contracted into κα, κα, κα, respectively. The exceptions to the above principle are the following: verbs in μι of the first class, in order to be distinguished from the third person plural, have in the three singular, κα contracted into κα.

The diphthongs κα, κα, when succeeded by κα are contracted, the former into κα, and the latter into κα. If a vowel, or κα, precedes κα, they are contracted into κα.

By attention to the pronunciation of κα, κα, κα, it will be perceived that the first, having a fuller found, predominates over the second and third; and, therefore, κα are contracted, not into κα, but into κα. In the concurrent vowels κα, the latter prevails in found over the former, and consequently, the contraction is into κα, not into κα. Conformably to the second case κα would be contracted into κα; but its contraction, in the common tongue, like that of κα, is generally into κα.

The vowels μι, being predominant in found, and from their nature incapable of coalescing with those subjunctive to them, cause the subjunctive to be expelled: as ινα, αυ, αυ, a hawk, ευα, ευα, a serpent, υπερα, υπερα, fishes, &c. As the contraction is the union of two short vowels into one compound found, it follows, that a short vowel preceding a long one, as having no effect in lengthening a found which does not admit of different degrees of length, is dropped in the contracted form; as Απολλων, Απολλω, Apelles, Emperor, Emperor, Emperor, kings, winds, επιμηκον, I honour, &c.

When a vowel precedes a diphthong, it is either itself rejected, or it ceases to be rejected one of the constituents of that diphthong; thus, κα preceding κα, expels the subjunctive ια, but preceding κα, it is itself rejected. In like manner, ια is rejected, when preceding κα, or κα. When ια precedes κα, it requires in nouns and adjectives the rejection of the subjunctive: also in the infinitive mood of verbs in κα, ια preceding κα requires to be rejected; but in the second and third persons singular indicative, the prepositive is dropped. Before κα and κα, ια is itself rejected.

In the adjectives εκκακος simple, εκκακος double, or εκκακος: thus, εκκακος, εκκακος. See Jones’s Grammar of the Greek Tongue, on a new and improved Plan, part ii. chap. 1.

**Contraction**, in Logic, or Composition, a species of reduction, wherein the thing that reduces does also abridge, or bring the thing reduced into a lesser compass. The design of contraction is to bring things, which before were too lax and diffusive, nearer together; that so their mutual relation may appear the more clearly, and they may better strengthen and support each other.

To this head are referred the arguments, as they are called, of poems and orations; the titles and summaries of chapters, &c. See *Abridgment*.

**Contraction**, in a general sense, means diminution of the bulk, or extent, of any thing; the nearer approach of its parts to one another. This word is generally used in philosophy, in surgery, in grammar, in the arts, &c. In philosophy the contractions mostly noticed, are those which arise from a diminution of temperature. The shortening of the dimensions of a body is the general effect; but at certain periods of their contraction, bodies change their apparent state of existence; thus the vapour of water is contracted by a diminution of temperature from a higher degree, down to about 212° Fahrenheit’s scale; but below that degree, its contraction is very great, and it is thereby converted into fluid water, in which state it occupies not more than about the 1800th part of the space it took up a little before its conversion into water. Similar phenomena are to be observed with most other bodies, and the particulars which need be remarked concerning them, are the rate, the quantity, and the limits of contraction in different bodies. But those particulars being the reverse of the phenomena which are described under the denomination of expansion or dilatation, are with more perspicuity stated under those articles, to which the reader is referred. It is, however, necessary in this place briefly to state a few particulars which seem less regular, and some which arise, not from a simple cause, but from the compound effect of pressure, and of diminution of temperature.

When an elastic fluid is contracted by cold within certain limits, determined by a degree of pressure to which it is exposed, as well as by the nature of the fluid, its particles become subjected to the force of cohesion; they rush still nearer together, and form a liquid. Thus, when steam under the common atmospheric pressure, is cooled below the heat of boiling water, it is instantly condensed, and becomes water; but with a pressure of two atmospheres, it would be condensed at a temperature 36° higher, and with the pressure of half our atmosphere only, it might be cooled without condensation 35° lower than the common temperature of boiling water. And similar effects take place in vapours of other kind at higher or lower temperatures, a double pressure producing, in all cases, an equal disposition to condensation, with a depression of temperature of between 20 and 40 degrees, and most commonly...
of about 35° of Fahrenheit. Thus the vapour of spirit of wine is usually condensed at 172° of Fahrenheit; but with a double pressure it is condensed at a temperature 39° higher; and with the pressure of half an atmosphere, at a temperature 35° lower; and the vapour of ether, which is commonly condensed at 192°, requires a temperature 38° higher, with a double pressure, or as much lower with half the usual pressure. If the temperature be below the freezing point of the liquid, the vapour being sufficiently press'd the vapour may still retain its elasticity, but a further reduction of temperature or increase of pressure will convert it immediately into a solid."

Water, and all aqueous fluids, are gradually contracted by a diminution of temperature, until they arrive at a certain point which is about eight degrees above the freezing point; but below that point they begin to expand and continue to do so according as their temperature is lowered. Effects nearly similar have been observed with a few metallic substances.

Speaking of contraction, a remarkable phenomenon, of considerable importance in manufactures, obtrudes itself on our notice. It is the hardeness which certain bodies acquire in consequence of a sudden contraction, and this is particularly the case with glass and some of the metals. Thus glass vessels suddenly cooled after having been formed are so very brittle, that they hardly bear to be touched with any hard body. The cause of this effect is thus properly explained by Dr. Young. "When glass in fusion is very suddenly cooled, its external parts become cold steel, and determine the magnitude of the whole piece; while it still remains fluid within. The internal part, as it cools, is disposed to contract still further, but its contraction is prevented by the resistance of the external parts, which form an arch or vault round it, so that the whole is left in a state of constraint; and as soon as the equilibrium is disturbed in any one part, the whole aggregate is destroyed. Hence it becomes necessary to anneal all glass, by placing it in an oven, where it is left to cool slowly; for, without this precaution, a very slight caule would destroy it. The Bologna jars, sometimes called proofs, are small thick vessels, made for the purpose of exhibiting this effect; they are usually destroyed by the impulse of a small and sharp body, for instance, a single grain of sand, dropped into them, and a small body appears to be often more effectual than a larger one; perhaps because the larger one is more liable to strike the glass with an obtuse part of its surface." See Prince Rupert's Drop.

The hardening of steel is an effect of the same sort. The piece of steel is made red-hot, and, in that state, is suddenly cooled and contracted by immersion in water; in consequence of which it remains so brittle and hard, as not to suffer its being filed or hammered. If, instead of water, the piece of red-hot steel be plunged in oil, its contraction is not so sudden, and of course its hardeness will not be so great. If it be plunged in quicksilver, which cools it much, quicker than water, its hardeness becomes so great as to render it capable of cutting or scratching glass like a silicious body. But, on the other hand, if the piece of steel, after its having been rendered red-hot, be suffered to contract gradually in the air; then its texture will easily yield to the hammer or to the file.

The necessity and importance of attending to the minute variations in the bulk of bodies by heat and cold, was never before, perhaps, so strikingly exemplified, as in the government Trigonometrical Survey, begun under general Roy, in the year 1794, by the measurement of a base of 27424:9 feet in length on Hounslow Heath, near London. This base was first measured by long deal rods, which were found too liable on account of their great and variable contraction and expansion, and long glass rods or tubes were next tried wherein the sum of the expansions of the rods, during the operation, reduced to 0.2° of Fahrenheit's thermometer, amounted to 5 inches very nearly, and of the contractions to 1.8 inch nearly, making an addition of 4.2 inches to the length of the base, as measured by the glass rods, on account of their expansion and contraction during the operation; see Phil. Trans. 1785, p. 427. In 1791, this base was remeasured with a steel chain made for the purpose by Ramfden, with all imaginable attention to accuracy, and the correction necessary to be applied to the length of the base, on account of the excess of the expansions over the contractions of the chain during the operation, was found to be 34.2 inches, but from which 27.1 inches was afterwards deducted, for reducing the base to the length which would have resulted, from a measurement in the temperature of 68°, to which point of the thermometer's scale all lengths in this survey are supposed to be reduced. See Phil. Trans. 1795, p. 433.

Contraction of Strata, in Natural History. That clay and argillites have contracted during their hardening in the strata of the earth, Mr. Bergman infers from having observed, that the petrified shells found in these are commonly compressed and flattened, and that argil hardens by contraction, but those found in line-lime retain their primitive shape, because these harden chiefly by infiltration.

Contraction is frequently used, by anatomical writers, to express the shrinking up of a fibre, or an assemblage of fibres when extended.

Convulsions and fits are supposed to proceed from a preternatural contraction of the fibres of the muscles of the part concerned.

On the contrary, paralytic disorders generally proceed from a too great laxness of the fibres of the parts affected; or from the want of that degree of contraction necessary to perform the natural motion or action of the part.

In the first, therefore, the animal spirits are supposed to flow either in too great a quantity, or irregularly; and, in the last, the animal spirits are either denied a free passage into the part affected, or the tension of the fibre is supposed insufficient to promote the circulation.

Contraction evidently appears to be the true natural state of all muscles; for, if a muscle be at any time freed from the power of its antagonist, it is immediately found to contract; and is not, by any action of the will, or the spirits, to be reduced to a state of dilatation.

Contraction of the heart, arteries, lungs, &c. See Sympoles, Heart, Artery, Pulse, &c.

Contradictente. See Nenime contradictente.

Contradiction, a species of direct opposition, wherein one thing is found diametrically opposite to another.

The schoolmen usually define it, opposition inter ens et nonem mecho carenos: where, by ens, and nonens, are understood any two extremes, whereas one affirms, and the other denies; and it is said to be mecho carenos to distinguish it from the other species of composition; the extremes, here, neither agreeing in subject, as is the case in privation; nor in essence and kind, as in contrariety.
CONTRADICTION, freedom of. See Freedom.

CONTRADICTORY, imply a. See IMPLY.

CONTRADICTOR, in a legal sense, a person who has a right or title to contradict or gain say.

An inventory of the effects of a minor ought to be made in presence of his guardian, or trustee, who is the legal contradictor: a decree against a farmer has no effect on the landlord, the first not being the legitimate contradictor.

CONTRADICTORY Propositions, are opposites, one of which imports a mere, and asked, denial of the other.

Of these, therefore, one must be positive, and the other negative; as fiting, and not fiting: white, and not white. Contradictory propositions mutually destroy each other.

To have two propositions truly contradictory, they must be opposite, both in quantity and quality, i.e., one must be universal, and the other particular, which make the opposition of quantity; and the one affirmative, and the other negative, which make the opposition in quality. Thus, e.g., "All use of wine and silver is evil," false:—"Some use of wine and silver is not evil," true. To this it is necessary, that the one deny and the other affirm, the same thing, of the same subject, contradicted in the same circumstances: unless the question be about an essential attribute, in which case, no regard is had to circumstances; every thing having always its own essence. This the logicians express by affirmare et negare idem, de eodem, secundum idem.

There may likewise be contradictory propositions on a particular subject; e.g., an individual. These are called single contradictory propositions; as "Peter is innocent. Peter is not innocent, or is a criminal." Now to have these propositions contradictory, Peter must be considered at the same time, without which they may be both true; since there may be a time wherein Peter was innocent, and another wherein he was a criminal.

CONTRA-FISSURE. See Counter-fissure.

CONTRA-HARMONICAL Propotion, that relation of three terms, wherein the difference of the first and second is to the difference of the second and third, as the third is to the first.

Thus, e.g., 3, 5, and 6, are numbers contra-harmonically proportional; for 2:3::6:9.

To find a mean contra-harmonically proportional to two given quantities; the rule is, divide the sum of the two squared numbers by the sum of the roots; the quotient is a contra-harmonically mean proportional between the roots.

CONTRA-INDICATION, in Medicine, denotes such a symptom, or lot of symptoms, as indicate the necessity of remedies, which other symptoms, or the disease in general, forbid us to employ.

Thus, when inflammation of the lungs supervenes to a low or typhous fever, or vice versa, the nature of the fever requires cords and strengtheners for its cure, whilst the inflammation indicates, on the contrary, the use of blood-letting, and other debilitating expediens. Contraindications are always perplexing occurrences.

CONTRAIINT, Fr. refrained. This word is synonymous with strettto, in It. (which see.) It is an adj. which, in Mus. implies, whether in melody or harmony, the con strictain of a theme or ground.

CONTRALTO, It., the Counter-tenor. The compas of this kind of voice is usually very limited; it seldom goes lower than G, in the 4th space of the base, or higher than C, in the 3rd space of the treble. Senecino had no more than

fit or seven good notes in his voice; nor had Guadagni, in his younger days, when he was content with the force of his natural compass, which, like Senecino’s, were full, rich, and flexible. This species of voice is an octave above the base; and its clef, that of C on the 3rd line, the same as the alto viola, or tenor, among instruments.

CONTRAMANDATIO Placitis, in Law Books, signifies a repitting, or giving the defendant further time to answer; or, an impertinence, or counter-manning of what was formerly ordered. Leg. H. I. c. 59. See Countermand.

CONTRAMANDATUM, a lawful excuse, which the defendant, by his attorney, allege, to show the plaintiff has no cause to complain, fit dies placitis fit contramandatum. 11 Hen. I. See Countermand.

CONTRAMURE, in Civil Architecture. See Counter-mure.

Contramure, in Fortification, is a wall built before another to strengthen it, and to prevent its receiving any damage from the adjoining buildings. See Rampart.

CONTRA-POINTS, in Music. See Counter-point.

CONTRA-POSITIO, in Law, a plea or answer. Leg. H. I. c. 54.

CONTRA-POSITION, in Logic. See Conversion.

CONTRAPPUNTO. See Counter-point.

CONTRARIENTUM Rotulus. See Rotulus.

CONTRARIETY, that which denominates two things contrary to each other.

Contrariety consists in this, that one of the terms imports a negation of the other, either mediately or immediately; so that contrariety may be said to be the contral, or opposition of two things, one of which implies the absence of the other.

CONTRARIETY, freedom of. See Freedom.

CONTRARIES, are positive opposites; which being of the same kind, or same common nature, and subsisting by turns in the same subject, are as remote from each other as possible, and mutually expel each other. Such are whites and blacks, cold and heat, &c.

Hence, properly speaking, only qualities can be contraries; contrariety, in effect, only agrees to qualities per se; to other things it agrees per accident, or in ordine ad qualitatem.

CONTRARY, however, is often used in a more extensive signification, viz., for any inconstancy or difference between the nature and qualities of things. It is a popular maxim in philosophy, that contrariety juxta fide poista magis cunferunt; contraries set off one another. In this sense is the word contrariy used in the schools; and hence an argument à contrario.

This method of improving things, à contrario, is much used, and with good success, by F. Bourdaloue, in his Sermons.

CONTRARY, in Rhetoric. Contraries are things which, under the same genus, are at the utmost distance from each other; so that what we grant to the one, we utterly deny the other; e.g., "Virtue ought to be embraced, therefore vice should be avoided." F. de Colonia lays down three kinds of contraries in rhetoric; viz. adversatives, privinivs, and contradistinctors.

Adversatives are those that differ much in the same thing, as virtue and vice, war and peace: thus Tully, "Si multiformis fugimus, sapientiam lequamur; & bonitatem, & malitiam..."
Contrary motion of the parts, in composition, and of the hands in thorough-bass, has a pleasing effect, and precludes the succedence of 7ths and 8ths.

Contrary propositions, in Logic, universal propositions, one of which affirms, and the other denies, the same predicate of the same subject; as "every square is a parallelogram," and "no square is a parallelogram." These propositions differ in quality, but not in quantity, and therefore are distinguished from contradictory propositions, which differ in quantity and quality.

Contrary propositions cannot be both true, but may both be false: whereas, in contradictory propositions, one is necessarily true, and the other false.

Contrary point of figure. See Point.

CONTRA-SOGGETTO, in Music, a 2d subject in a fugue or canon, or a new subject, in contrary motion to the first.

CONTRA-TONES, in the German Musical Writings, are such as lie below the great obsidian of their tablature or literal notation, for the notes of the gamut. All notes on an organ, or other instrument which lie, more than two octaves below the tenor cliff note, or $\frac{2}{4}$, are said to be contra-tones. See Tablature.

CONTRAST, in Painting or Drawing. The proper introduction and management of contrasts of lines, forms, colours, lights, and shadows, form a very principal, and indeed indispensable, branch of the study of a painter; and there is perhaps nothing in the art which so necessarily requires a more than ordinary share of judgment and discretion. If contrats are only sparingly used, they seldom fail to produce a striking and happy effect; if they are too frequent, confusion in the composition, and a spotty disagreeable effect is the consequence; when they are entirely omitted, infipidity ensues. Contrasts in painting may, therefore, be compared to discord in music, which, when skilfully introduced, give double relish to the harmony, by preventing that nausia naturally attendant on an uninterrupted succession of sweets of any kind forever. The subject of contrats is necessarily connected with our inquiries respecting the great component parts of painting. We therefore beg to refer the reader to those articles. See Invention, Composition, Design, Expression, Clair-obscure, and Colouring.

Contrast, in Architecture, is to avoid the repetition of the same thing, in order to please by variety; as is done in the great gallery of the Louvre, where the pediments are, alternately, arched and angular.

Contrast, or Contrate, wheel, in Horology, denotes that wheel in watches which is next to the crown, whose teeth and hoop lie contrary to those of the other wheels; whence its name. See Watch-work and Wheel.

CONTRAVALLATION, or Counter-vallation, in Fortification. See Circumvallation.

CONTRAVENATION, a man's failure of performing or discharging his word, obligation, or duty, or the laws and customs of the place. The penalties imposed in cases of contravention, only pass for complimentary.

In a more limited sense, contravention implies the non-execution of an ordinance, or effect.

Contravention is supposed to be a degree below previration; and to be only the effect of negligence or ignorance.

In the French and other services, every commanding officer, of whatever rank, was responsible for the wrongs and trepilations committed by the troops under his command. He was obliged to pay the damages; and if himself set an example of such things, he was considered as doubly culpable, and was not only bound to pay the damages, but was otherwise punished.

CONTRAYERTA, in Botany. See Dorstenia.

CONTRAYERTA, in the Materia Medica, Dorstenia Contrayera, Linn. This is a perennial plant of South America, the root of which has long been used in medicine, and is still retained, though its medicinal powers are but moderate. It is said to have been first brought into Europe by Sir Francis Drake, about the year 1581, and from him called Draken.
It was then esteemed a very great alexiterial, and a
sovereign antidote against poisons.

Its juice is a violent poison, said to be used by the Perus.
vians to poison their arrows. Contrayerva signifies coun-
try-va, because the root of it is said to be an antidote against
the poison of its juice.

The root is knotty, reddish brown externally, and pale
within: its taste is sub-astringent, warm, and somewhat
bitter; but its acrimony is much flattened by the very large
quantity of mucilage which it contains. Contrayerva is a
gentle stimulant. Its use is almost entirely confined to the
pulvis contrayervae compositus, in which it is mixed with
crab's claws and chalk. The London Pharmacopeia directs
the preparation of it, by mixing 5 ounces, by weight, of
powdered contrayerva with 1/2 pound of compound pow-
der of crab's claws.

There is another kind of contrayerva brought from Vir-
ginia, more ordinarily called serpentinaria; this is very aro-
matic; it is but seldom preferred singly, though said to
have the same success against poisons and venoms with the
contrayerva of Peru. This is an excellent substitute for the
contrayerva. See Lewis's Mat. Med. and Newman's
Chn. Works.

CONTRE, Fr. in combination with words. See
Counter.

Contre-dance, Fr. Country-dance, taken from the lively
and familiar dance of our peasants and villagers in England.
Some, however, imagine that, during the Norman line, we
had this rural dance from the French contre-dance, in which
the partners are placed opposite or against each other. Of
this opinion was the late Mr. Donouy, dancing-master to
the royal family.

Contre-feux. The French make use of this expression,
in English, for an absurdity in composition or performance.

Contre-temps, Fr. is a breach of time, or false accentu-
ation. Rousleau. But M. Framery (Encycl. Meth.) is
not satisfied with this definition. According to him, an air
is a contre-temps, or out of measure, when the clores are
prepared on the accented part of a bar, and made on the unac-
cented part. The ear expects that the clofe or final part of
an air or movement should be on an accented part of a bar;
in common time of four crotchets, on the first and third;
and in triple time, on the first note of a bar. To this we
accede, except in Polifh airs, called Palomoge, or nity Palence,
where the clofe is made on the second note of a bar. See
Polonese.

Contrebia, in Ancient Geography, Sanctaer, a town
of Spain, in the country of the Carpathi, ealt of Complu-
tum. This town, in 571 or 572, was beleaguered by the Ro-
mans, under the conduct of Q. Flavius Placidus; and, in
consequence of the delay of succour, solicited from the Cel-
tibrians, was obliged to surrender. When the Celtiberians
afterwards arrived, they were surprized by the Romans, and
totally defeated.

Contrebi, in Geography, a town of Arabia, 180
miles S. of Mecuat.

Contres, a small town of France, in the department
of Loir and Cher, and chief place of a canton in the distriict
of Blois. Its population amounts to 1401, and that of the
canton to 10,105, persons, divided among 16 communes,
upon a territory of 265 kilometres in extent. It is situated
16 miles S. of Blois.

Conti, Antonio, in Biography, was the son of a
lawyer at Ferrara. In his youth he spent some time in the
study of art, which he practised many years in the two
capitals of Rome and Paris. Upon his return to Italy, he
settled at Cremone, where he studied the painting of land-
scape, under Francesco Baj. His pictures were frequently
embellished with flowers: a species of painting in which he
most excelled. But his claim to a place in this work rests
principally on a very extraordinary discovery which he made,
of the method of transferring pictures, painted in fresco on
the wall, to canvas, without in the smallest degree impairing
the original beauty of the painting. This he effected by
means of a strong cement, or rosin, which he spread over a
cloth, the same size as the picture he was desirous of remov-
ing. This was then firmly applied to the face of the fresco.
A panel of the same size was then fastened to the back of
the cloth, when the plaster or fresco was cut round to the
size of the cloth. After some days, the board with the
cloth was removed from the wall, drawing with it the paint-
ing. Another cloth, prepared with a cement still stronger
than the first, was then applied to the back of the picture;
after which the former cloth was removed, leaving the pic-
ture in its original state of perfection. He succeeded in
many experiments of this kind in Cremone, Ferrara, and
Mantua. This secret, however, has been seldom divulged;
and the late pope, Pius VI., for many years, gave a confi-
derable pension to the only person who was acquainted with
Rome, upon the condition of his removing no fresco
paintings from the Ecclesiastical State without his permis-
sion: wisely judging, that though the temples and palaces of
Italy might be deploited of oil pictures, the frescoes of the
great masters would at all times furnish sufficient example
for students, and ample gratification to the curious traveller.
Antonio Conti died in 1732, leaving a son named Fran-
cesco, who followed the footsteps of his father. Lanzi;
Storia Pittorica.

CONTRIBUTA, in Ancient Geography, Medina de los
Torres, a town of Spain, in the eastern part of Berta; is
called also "Julia Contributions.

CONTRIBUTION, the payment of each person's
quota, or the part he is to bear in some imposition, or com-
mon expense.

Contributions are either involuntary, as those of taxes and
imposts; or voluntary, as those of expenses for carrying on
some undertaking for the interest of the community.

When goods are cast into the sea, for the safe-guard of a
ship, or other goods, &c. abroad, in a tempell, there is a
contribution among merchants, towards the los of the
owners. (See Insurance.) And where a robbery is com-
mitted on the highway, and damages are recovered against
one or a few persons, in an action against the hundred, the
reel of the inhabitants shall make contribution to the fame.
27 Eliz. c. 13. See Robbery.

Contributions, Military, denote impositions, duties,
or taxes, which places and sometimes frontier country pays
to redeem themselves or purchase exemption from being pil-
laged, plundered, and infested by the enemy.

It would cost a prince often too much to make war en-
tirely at his own expence. If he adopt just measures ac-
cording to his finances not to run short of money, he takes
them also with his general for finding the means of aug-
manship or at least preserving his funds. These means are
contributions, which are of two kinds, viz. those which
are exacted in subsistence and commodities, and those
which are received in money.

Those that are paid in commodities, or subsistences, are
different sorts of grain, forage and provisions, carriage for
things wanted as well by water as by land, word of every
species, pioneers, and a particular treatment or entertain-
ment of troops in their winter-quarters and lodgings.

No levy ought to be made or taxes raised till a just
statement is procured of the situation of the country intended
to be laid under contribution, that the imposition may be rendered as equitable and little burdensome as possible. No demand, for example, is made of wood on those places that have only grain or meadows, or of land-carriages on those who make use of water-carriage.

The levy of different sorts of grain is made on those tracts or districts of country, that have quietly and peaceably reaped their harvest, and as it were by way of gratitude or acknowledgment for the tranquillity they have enjoyed, through the good behaviour and discipline of the army.

That of oats and other grain for horses should be made under the colour of pretext of regularity or good order, by which means a country is infinitely less burdened than it would be, were it abandoned to the avidity of horsemens, who would carry off the grain, wherever they might find it, either in a regular or irregular manner, or with orders or without orders.

That of forage should be made in the same manner, and a convenient time should be fixed on for the carriages that are to carry it to the places, where it is resolved it shall be consumed and made use of.

That of provisions is usually made, if it be possible, in those districts of country, where the troops cannot winter, to prevent the occasioning of a scarcity in that where they are to take up their winter-quarters.

Carriage, whether by land or by water, is necessary for filling the magazines made in the rear of the armies with ammunition and provisions; or for the taking of heavy artillery and ammunition to a place besieged; or for the removing of sick and wounded; or for the transport of materials defined for works.

Impositions of wood are made for palisades, for the construction of caissons and tables, &c. and for fuel to the troops in winter.

Pioneers are assembled or collected together to fortify posts designed for wintering the troops in; for throwing up with promptitude and expedition lines of circumvallation round a place besieged; for repairing roads and opening defiles; for the construction of lines made with a design to cover a country and thereby exempt it from contributions; and for levelling and filling the works made before a place after it is taken.

Utensils and necessary for the troops taken in an enemy's country are raised or obtained in two ways. The places, where they winter, should not furnish more of them than the conveniencies which the soldier finds in the house of his landlord, supposing there are no barrack in those places. But if there are barrack, the contribution in money is compensated by these commodities, and ought to be less than that which is raised in a level country or in towns, where there are no troops lodged.

The contribution in money is extended as far as possible. It is established in two ways; voluntarily over tracts of country within reach of posts and places defined for winter-quarters; or by force, whether by the army itself while it is advancing, or by large parties that are detached for penetrating into these parts which you wish to lay under contribution.

It is made also behind the places belonging to the enemy and rivers by means of terror, whether by incendiaries disguised, who spread and disseminate billets, or by different ways, in which small parties are made to pass the rivers, who endeavour to carry off some persons of consideration in the country, or to burn some large habitation, or dwelling place, or building.

A prince in fear ought to have an exact account kept of all contributions, and have those particularly looked after, who are employed in raising and collecting them, since it is but too common for them to make an improper use of what they raise or collect for their own personal advantage. And when the contributions are not judiciously assessed and demanded, the particular interest of those who impose them, or receive them, always prevails over the interest of the prince or soverign.

It is a great relief and easement in contributions, when they are imposed with justice, equality, and in an exact proportion to the abilities of those on whom they are raised; and when they are collected without insolvency, without severity or oppression, and without being converted to the profit or benefit of individuals; and when, in default of money, other goods and commodities are taken, as cloths, provisions, &c. but most of all when an army quits its own country to make war in that of the enemy or any other, whatever it may be.

Frederic I., or the Great, in speaking of the conduct of an officer sent out to levy contributions, expresses his sentiments in the following words: "Contributions are generally levied under one of the following circumstances; either being superior to the enemy you cover the whole country; or you make a part of it till the arrival of the enemy; or you are intercepted by their light troops."

"In the first case it is common for the commander in chief to fix the sum to be raised by the inhabitants, under pain of military execution. Upon this duty the officer must vigorously exert his utmost authority to make his sufferers observe the strictest discipline and decorum, lest the inhabitants should be ruined beyond recovery."

"The second case requires great circumspection in the officer, and a perfect knowledge of the country, that he may not be surprised by the unexpected arrival of the enemy; he must pre-determine his plan of retreat, and fix the place of general deposit; and for his farther security he must advance small detachments towards the enemy, that he may have early notice of their approach, and to interrupt all communication with the inhabitants."

"On his first arrival in the country, he will dispatc circulating billets of delivery, the duplicates of which are to be carried by the parties which are sent to levy the contributions. These parties are to have orders to return at a certain time, besides which they are to have sealed instructions indicating the places of second and third rendezvous, but these orders are not to be opened unless in cases of necessity."

"When contributions are to be raised in this manner, with the enemy at your heels, all lenity is out of the question. Where there is no coin to be had you must take any thing, that may be safely transported, or cattle, or hollages; but these only as your last resource. If you are close pressed by the enemy, it is best to divide your booty and lend it different roads, that you may save at least some part of it."

"In the third case, namely, when the enemy hinders the inhabitants from delivering their quotas, the peasants are in a great danger of total ruin. Nevertheless, as the exigencies of the army require it, you are to proceed with all possible rigour, and even to punish those who neglect to deliver their proportion at the time required, that the rest through fear may be more punctual in obeying the orders they have received."

CONTRIBUCIONE FACienda, in L. 1620, a writ which lies where several persons are jointly bound to the same thing, and one or more of them refuse to contribute their share.

If tenants in common, or joint, hold a mill, pro indiviso, and equally share the profits of the same; the mill failing to decay,
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decay, and one or more of them refusing to contribute to its reparation, the rest shall have the right de contributio
sanc
d to compel them. And if there be three copreccners of land that owe suit to the lord's court, and the eldest per
forms the whole; then may he have this right to compel the
refusers to a contribution. So when one suit is required for
land, and that land being sold to divers persons, suit is de
mended of them all, or some of them by dissent, as entirely
as if all the land were still in one. Reg. Orig. 175. F. N. B.
162.

CONTRITION, in Theology, expressés a real sorrow, re
fulting from the thought of having offended God; from
the sole consideration of his goodness; without any regard,
or, at least, independently of any respect, to the punishment
unrelated to the sin; accompanied with a detestation of sin,
and of ourselves on account of it. With this act of the
mind, it is said, that repentance, properly speaking, be
nings.

Some of the Roman doctors avow, notwithstanding the
practice of their church, that contrition is valid, and car
ries with it every thing necessary to obtain pardon, without
the ceremony, or as they call it, the sacrament of confec
tion and absolution.

And in this they make the difference between contrition
and Attrition (which see) to confit. This doctrine was
maintained by F. Seguenant upon St. Augulline; but it was
confurred by the faculty of Paris.

CONTROL. See COMPTROL.

CONTROLLER. See CONTROLLER.

CONTROLEES, Fr. the same as MUSTER-ROLLS, or
REGISTRY-BOOKS; which see.

CONTROLEUR General d'Artillerie, controller general
of artillery. This appointment was of an old standing in
France, and was next to that of grand master or master general
of artillery, except that of garde general d'Artillerie. It was
however suppressed, and in 1792 Louis XIV. created two of
fices in lieu of it, viz. that of directors general of artillery,
and that of commissary general of powder and salt-petre.
But by his declaration of the 21st July 1716, he superseded
these offices, and several others, and attached to that of con
troller general all the ancient functions, which that officer
afterwards exercised in their full extent, and which had been
established by the edicts and declarations of Francis I. and
his successors.

It is an office of great military importance, and much
reponsibility. He has a number of commissaries paid by
the state to act and manage under him, by his orders, and in
his name. They affit at the various proofs of powder and
pieces of ordnance, and can take and demand an account of
the purchases made in their absence by the principal officer
of artillery.

CONTROLEURS Provinciaux d'Artillerie, provincial con
trollers of artillery. These officers in France used to con
trol all the expenses and purchases in general, of whatever
kind they might be, that concerned the artillery, and could
refuse or reject the arms, ammunition, and in short every thing
that proved defective, on the deliveries of articles purchased
or contracted for. They have each of them a key of the
magazines where they reside. And upon entering on the
exercise of their office, they caused inventories to be given
to them by the gardes-magazines of every article in them,
of which they made a register, and on it added the receipts,
returns, and expenditures of stores, that they might be al
ways able to render an account to the controller general,
and the commandants of artillery. They often made their
visits, and chiefly at the same time that the commandants of
artillery made theirs. They gave certificates of the dead
and wounded, and made an inventory and sale of the effects
of the dead, with the concurrence of the commissaries, or the
major des equipages.

CONTROLEUR General de depots de l'Artillerie, controller
general of the expenses of the artillery. These officers kept
registres or accounts of the receipt and expenditure in money
which was made by the treasurer general of artillery, as well
as of the receipt and expenditure of pieces of ordnance, am
munition, and of purcahes.

CONTROLEURS des Guerres, war controllers. The func
tions of a controller des guerres are to keep a register and
control of the munitors and reviews of troops. See the ar
icle MUSTER-MASTERS.

CONTROLEURS d'Artillerie, controllers of artillery. See
the article CONTROLEURS Provinciaux d'Artillerie.

CONTROLEUR General des Ventes, controller general
of provisions. The undertakers used to choose for this em
ployment an old commissary who was perfectly acquainted
with the business, and was a person deserving of confidence.
He had a very extensive commission for inspecting and tak
ing cognizance of every thing that concerned provisions;
and the exercice of his duty was considered as conferring
of two parts; namely, that he should be in the first place
make himself properly acquainted with the state of the magazines
that were to supply the army, and in the second place
accompany the director general of provisions, to whom he
was subordinate when he should take the field.

The first thing which the controller-general of provisions
used to do, was to make a lift or statement of all the places
that depended on him, and of the commissaries who did duty
there. He inquired what were their functions, into their
character for zeal and spirit, the extent of their genius, their
capacity, what offices they had been employed in, what fa
milies they were of, or had, the places of their birth, their
age, and their manners.

He examined if the registers of the magazines were in
proper form, both as to receipts and expenditures, and ex
penses; as to the receipts, if the quantity in them is well
specified, the quality, the different names of the measurers,
the weights of the country reduced to avoid disproport weight,
in case it should be different; if the name of the feller, the
place of his abode, and the date of the purchase, are set
forth in the article.

As to the expense, he examined what supplies the com
missary had sent to the magazines, or procured, the nature
of the grain and flour, the quantities, and the copies of let
ters of carriage of the articles sent. After taking an extract
of the receipts and expenses, he saw what remained in the
magazine, how himself counted the sacks, and made a certified
state of the whole to be given to him.

The duties of this office, in short, were so many and
troublesome, that if this officer, who, we have already ob
erved, was subordinate to the director general of provisions,
literally fulfilled them, he could not have had so much as one
day of rest or repose during the whole continuance of a cam
paign. See COMMISSARY-GENERAL of Stores.

CONTROLEUR des Hospitaux Militaires, controller of mil
itary hospitals. Whenever a sick or wounded person enters
an hospital, this officer writes upon a register endorsed
and marked by a commissary of war, the military appellation
or designation of the person sick or wounded, the name of his
family, the place of his nativity, and the city nearest to that
place. He makes also two statements of his money and his
effects, one of which serves as etiquette au paquet, or ticket
to the parcel or packet, and the other is returned to the
sick or wounded man, in case of whole death an account is
rendered to the major of the regiment to which he belonged.
For
For the most part, however, the undertakers are the heirs or
inhabitants, for after a year and a day no part of either can be
demanded from them.
This officer signed the billets of soldiers when they entered
an hospital, and made them report themselves to him when
they went out. He obliged the overseers of inmates to render
an account of the dead immediately after their decease;
and that Remigii's death was the signal of his resignation.
In hospitals where there was no controller, every thing now
mentioned was executed by the director.
CONTROVERSY, in Law, a person who of his own head
devises or invents false or signed news. 2 Inst. 327.
CONTROVERSIAL DIVINITY. See Polemical
DIVINITY.
CONTROVERSY, or CAUSE, State of a, among An-
cient Rhetoricians, denotes the principal point in dispute be-
tween contending parties, upon the proof of which the whole
cause or controversy depends. Ancient writers have express-
ated it by several other names, as "the constitution of the
causa," "the general head," and "the chief question." (Quint.
Inst. Orat. l. iii. c. 6.) As this is the principal thing to every
controversial discourse, it also requires the proper consideration of the speaker, and should
be well fixed and digested in his mind, before he proceeds to
investigate arguments for its support. See Antony's ac-
count of his own method of pleading, in Cic. de Orat. l. ii.
c. 27; Quintilian (Inst. Orat. l. iii. c. 6) describes the subject
of this article to be "that kind of question which arises from
the first conflict of causes." In judicial cases, it immediately
succeeds the charge of the plaintiff, and plea of the defend-
ant. Our common law expresses it by one word, viz. the
issue: which fee. This interpreters explain by describing
it to be "that point of matter depending in suit, upon
which the parties join, and put their cause to the trial."
Thus, in the cause of Milo, the charge of the Clodian party
is, "Milo killed Claudius." Milo's plea or defence is, "I
killed him, but justly." Hence arises the grand question, or
"state of the cause;" "whether it was lawful for Milo
to kill Claudius?" That Claudius was lawfully killed by Milo is
what Cicero, in his admirable oration, in defence of Milo,
principally endeavours to prove. The whole of his discourse
is to be considered as centering at last in this point. Again,
in the case of Robespierre, the charge made against him is "that
he killed his father." But he denies the fact. The grand
question therefore to be argued is; "whether or not he
killed his father?" Cicero's defence in his defence of him is
to shew, that his accusers had not made good their charge.

Besides the principal question, there are subordinate
questions that occur in the course of a dispute, which should
be carefully distinguished from it: and more particularly
that, which arises from the reason or argument alleged in
proof of the principal question. Thus, in the cause of
Milo, his argument is, "I killed Claudius justly, because
he assassinated me." Unles the Clodian party be supposed
to deny this, they give up their cause. Hence therefore
subordinate questions arise; "whether Milo assassinated
Milo?" Cicero spends much time in the proof of this, as
the hinge, on which the first question, and consequently the
whole cause depended. But whatever may be the number
of subordinate questions, they are all dependent upon the first;
and though each of them has its particular state, yet neither
of these is what the rhetoricians call "the State of the Cause,"
which is to be understood only of the principal question.
Besides these subordinate questions, incidental ones are often
introduced, having some reference to the principal question
and contributing towards the proof of it, though they are not
necessarily connected with it, or dependent upon it. Each
of these has its "state," though different from that of the
"cause." Many questions of this sort occur in Cicero's
defence of Milo, occasioned by asperities that had been
thrown out by the Clodian party to the prejudice of Milo.
To each of these Cicero replies, before he proceeds to the
principal question. And therefore, though the question,
in which the "state of a Controversy" confisits, is said by
Quintilian to arise from the first proposition of the
speaker, yet, if we view the instance of Cicero, now adduced,
that it is not always the first question in order, upon which the
orator treats. It sometimes happens, that the same cause or
controversy comprehends more than one state. Thus in judi-
cial causes, every distinct charge occasions a new state.
All Cicero's orations against Verres relate to one cause,
found upon a law of the Romans against unjust executions,
made by the governors of provinces upon the inhabitants;
but as that prosecution is made up of as many charges, as
there are orations, every charge, or inditement, has its dif-
ferent state. It may be observed, that discourses of a
deliberative and demonstrative kind, as well as judicial,
are managed in a controverted way: and all controversies have
their "states." And therefore Quintilian very judiciously
observes (Inst. Orat. l. iii. c. 6) that "states belong both to
general and particular questions; and to all sorts of causes
demonstrative, deliberative, and judicial." As to the number
of these "states," Cicero and Quintilian reduce them to
three. "Three things," says the latter (Inst. Orat. l.
iii. c. 6) "may be inquired into in all disputes; whether
the nature of it, what it is, and how it is. And this is the
method which nature prescribes. For, in the first place, it is
necessary the thing should exist, about which the dispute is;
because no judgment can be made either of its nature or
quality, till its existence be manifest; which is therefore the
first question. But though it be manifest, that a thing is, it
does not frequently appear what it is; and when this is known
the quality yet remains; and after these three are settled, no
further inquiry is necessary." The first of these three states
is called the "original state;" the second is called the de-
definite state; and the third is called the state of quality. The
first occurs when it is inquired, "whether one person
killed another?" The second appears in an example
of Cicero; "whether to take a sacred thing out of a private
house be theft, or sacrilege?" The third is manifest, when
the contending parties are agreed both as to the fact, and
the nature of it; but the dispute is, "whether it be jut
or unjust, profitable or unprofitable, and the like?" as in the
cause of Milo. Aristotle (De Rhet. l. iii. c. 26.) and from
him Vossius (Inst. Orat. l. i. c. 6, § 7) add a fourth
state, namely that of quantity; e.g. "whether an injury
be so great as it is laid to be?" Quintilian, however, thinks
(ubi supra) that this may be referred to one or other of the
preceding states; since it depends upon the circumstances
of the fact, as the intention, time, place, or the like. The
importance and use of the preceding observations require
little illustration. Whenever a person engages in a contro-
versy, he ought in the first place to consider the main question
in dispute, to fix it well in his mind, and to keep it con-
stantly in his view: and it is equally necessary for his hearers
duly to regard this point, as they will thus be enabled to
distinguishing and separate from the principal question what is
only incidental, and to observe how far the principal question
is affected by it; to perceive what is offered by way of proof,
and of illustration; not to be misled by digressions, but to
discern when the speaker deviates from his subject and when
he resumes it; and to accompany him through the whole
discourse and through his whole chain of reasoning, as to
be able to judge, upon the whole, how far his conclusion is
fairly
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fairly drawn from his ascribed premises. A constant regard to the state of the cause, and principal point in dispute, is very necessary for this purpose. Although the putative treat of these states only as they relate to controversies, and become the full subject-matter of dispute between differing parties; yet every dispute has one or more principal heads which the parties usually propose to prove or illustrate. Ward's Ort, vol. i, let. vi.

CONTUBERNALES MAGISTRATUM, companions of the magistrates. These were young men defined for civil and military employments, whom the magistrates, in the time of ancient Rome, took into their department to be formed under their eyes and in their houses.

The same application of contubernales was also given to ten soldiers, who lived in one and the same room or under one and the same tent.

CONTUBERNIUM, in Antiquity, denotes a sort of connection or habitation that took place between male and female slaves in the middle ages. Although their masters or proprietors did not permit them to marry, they were allowed to form this kind of union. This practice so much prevailed, that during several centuries after the barbarous nations embraced Christianity, slaves, who lived as husband and wife, were not joined together by any religious ceremony, and did not receive the nuptial benediction from a priest; when this conjunction between slaves came to be considered as lawful marriage, they were not permitted to marry without the consent of their master, and such as ventured to do it without obtaining that, were punished with great severity, and sometimes were put to death.

CONTUCCI, Andrea, in Biography, likewise called Andrea Sanflovino, from a town in the Tuscan dominions, which gave him birth in the year 1460. Like Giotte he was the son of a simple shepherd, and, like him, his genius for design discoverer itself in childhood, by the drawings which he made in the sand, and the models which he amused himself with forming out of clay. These youthful productions were seen and admired by Simone Vepcucci, then chief magistrate of the town of Sanflovino: he perceived in them the propensities of the future fame of our young artist, and obtained the permission of his father to carry him to Florence, where, under the tuition of Antonio Puliabulo, he made a rapid progress, and ultimately became one of the most celebrated architects and sculptors of his age. The chapel of the sacrament, in the church of Santo Spirito at Florence, although small, is a beautiful specimen of the perfection in which he attained in the former art, and is so finely put together that it appears as if chiselled out of one stone. By this, and other works, he soon acquired an extended reputation; innumerable, that he was invited into Portugal, where he erected many edifices, and amongst others a palace with four towers for the king. After nine years residence in that country, he returned, loaded with presents, to Italy, and was employed by Leo X. in many considerable works; especially in the statues and baso-relieves which ornament the Santa Casa of Loreto. Several of his other productions in sculpture are at Rome, particularly two sepulchres within the choir of the Madonna del Popolo, and a fine group representing St. Anne, Christ, and the Madonna, in the church of St. Agostino. He died much regretted in the year 1529, at the place of his nativity. Milizia, Mem. degl. Architetti.

CONTUMACY, in Lexo, a refusal to appear in court when legally summoned; a disobedience to the rules and orders of a court having power to punish such offence.

The word is used in civil as well as in criminal matters; but more rarely in the first, wherein the words defaulter, and

CONTRARY, ordinarily supply its place: the refunding of the charges of contempt, judged at the hearing, is also the penalty of contumacy. In a criminal suit, the contumacious is condemed, not because the crime is proven, but because he is absent. By the Roman laws, there was no process in case of contumacy, during the first year of absconds: they only took an inventory of the goods of the fugitive, and if he died in the year, he died integra status; but, after the year was expired, he was deemed culpable.

In England, contumacy is to be prosecuted to outlawry. In France, all contumacies are amnesty'd, if the accused make his appearance in five years: if he die in that time, his relations are allowed to purge his memory.

CON, in Surgery, a bruise, from the Latin contusio. This term is applied to this kind of lesion which is occasioned by the application of a blunt substance to the surface of the body, with more or less violence, but without dividing the skin; it is also used, when any part has been pinched, compressed, or fractured. The first effects of a contusion are a laceration of fibres, or an entire loss of tone in the injured part; and its common symptoms are swelling and inflammation. A violent contusion occasions considerable blemishes, as well as amongst the many symptoms which, effusion of fluids into the neighbouring cellular texture, and even fractures of the bones, are the most frequent. (See ECHYMOSIS and Contused WOUND.) A violent contusion operates not only upon the part at which it immediately takes place, but also upon remote parts of the body; and the lesions thus produced are termed counter-injuries. See COUNTER ISSUERE.

The degree of the contusion does not always depend upon the force which has occasioned it, but also often upon the nature of the parts that have been bruised. The contusion is always violent, when there is a bone in the injured part, which is little covered with fleshy substance. In every such case of contusion, inflammation, with all its bad consequences, is to be apprehended. In healthy persons, violent contusions often produce as serious consequences; but in persons whose bodies are previously debilitated, flight contusions frequently produce gangrene and ulceration. Extravasated fluids, even though in large quantity, are diffused and absorbed, especially when they are situated in parts of a loose spongy texture, or amongst the many symptoms of which, effusion of fluids into the neighbouring cellular texture, and even fractures of the bones, are the most frequent. (See ECHYMOSIS and Contused WOUND.) A violent contusion operates not only upon the part at which it immediately takes place, but also upon remote parts of the body; and the lesions thus produced are termed counter-injuries. See COUNTER ISSUERE.

With regard to the cure, contusions frequently occasion more trouble to the surgeon than fractures; according as the operation and counter-operation of the force applied has been more or less violent, and also according as the patient does or does not give the injured part the requisite repose, which is equally necessary in cases of contusion as it is in fractures. The lighter degrees of contusion require nothing more than the use of external diffusive and astringent remedies; the habit of which are cold water, wine, brandy, vinegar, and solutions of sal ammoniac, or of alum, or decoction of Peruvian bark, &c. The weakened and stretched parts (if there be not much pain or inflammation) may also be supported by the pressure of a tight bandage; and when the contusion is of considerable extent, by bandaging the whole limb. When the patient is pellagrous, and the bruised part is of importance, a vein must be opened, or leeches applied to it.
In the more violent degrees of contusion, the patients require evacuations, especially cooling purgatives frequently repeated. External pressure and friction, when the extravasation is considerable, will greatly aid its absorption, and is therefore beneficial. The more important is the bruised part, and the more copious the extravasation, the more affi-
dately must all these remedies be employed; but in less exten-
sive contusions, the external applications may be suffi-
cient. However, the cold fomentations and spirituous affriments must not be applied without proper feclusion. A decoction of difunct herbs in wine, or in a mixture of equal parts of wine and water, especially when aponeurotic and tendinous parts have been much injured, produces often the greatest benefit; and to this may be added also sal ammoniac, when the pain and tension have abated. But if the skin be abraded, these affriming applications cannot well be employed.

Sometimes the pain increases, in spite of these applications, to such a degree, that emollient cataplasmes and oelcagious frictions become necessary: the following method is particularly recommended in such cases. Rub well the whole bruised part, above and below the contusion, especially below it, with good oil, and then cover the whole with a mixture of olive oil and strong wine-vinegar, formed into a kind of liniment by agitation. This mixture may be laid upon thick lint, wrapped round the whole part; thus, when the angle has followed the contusion, a part of the leg and foot must be covered with it. These dressings are to be renewed twice or thrice a day, till the swelling and pain dis-
appear. The whole part must then be frequently rubbed with camphorated spirit of wine. When this has been done for about three or four days, a cloth may be applied, spread with a thick ointment composed of white of egg mixed with crude alum. This may be repeated about three times, with intervals of 12 hours.

The yellow or blue spots that remain after the cure of contusions, may easily be made to disappear, by applying to them a mixture of bran, salt, and vinegar, boiled together till the bran has imbribed the fluids.

When the quantity of extravasated blood is very large, or when it is situated in a part which it cannot easily be ab-
forbed, or when it gives rise to symptoms which demand speedy relief, it must be immediately evacuated by an inci-
ion, and the fore treated like a wound combined with con-
tusion. The same practice must all's be observed, when the internal haemorrhage by which the extravasation is produced, proceeds from a large vessel, continues, and requires to be fliamed by some particular applications; or where, before the extravasation, other lesions of the parts are also present, as, for example, when the bone has been shattered. Should there still remain lumps of coagulated blood behind, after the use of the difunct remedies, these must also be removed by incisions, if they threaten to produce further mischief by their pressire.

Blows and contusions of the joints deserve particular at-
tention: for in these situations, especially in the knee joint, they are always dangerous. The confuses are violent pain and impeded motion; the pain is generally severe at first, but sometimes not. In the first case the ligaments, and in the second the glands, or interior parts, of the joint have been principally affected. In the latter case the conf-
sequences are dryly, or even luppuration of the joint, which frequently proves fatal. When the ligaments or other ex-
ternal parts of the joint have been injured, the part must be kept quiet, and treated, according to the peculiar circum-
stances of the case, with the remedies formerly mentioned, but especially we should have recourse to leeches: it may afterwards be washed with spirituous and saline applications.

When the pain has ceased, and there remains behind, as often happens, a stiffness in the part, the soap, liniment, and vapour bath may be employed with advantage. Should arthritic afflictions be superadded, speedy relief must be pro-
cured, and the dangerous confquences obviated by cupping, blisters, friction with flannel, and the internal use of cam-
phorated remedies. When the ligaments have been stretched and relaxed by a fall, the German surgeons apply, with good effect, small bags filled with the warm powder of plaster of Paris, mixed with a fourth part of sal ammoniac and common salt.

When the glands, or internal parts of the joint, have been injured, the surgeon ought not to intermit the application of appropriate remedies, till the pain has entirely ceased, especially repose, blood letting, and cold fomentations. The lesion of a joint, particularly of the knee, by a fall, blow, &c. easily gives rise to a white swelling of the part. In such cases the surgeon cannot employ too great care and attention, as the symptoms are so numerous and diversified, that it is in vain to expect a fortunate result from a careless and wanton practice.

Internal contusions are attended, more or less, with dis-
tressing and serious symptoms. If the head be violently con-
tused, there is danger left the brain should have suffered at the same time; or left the effused blood, lying long upon the cranium, should injure the bone by its pressire, if it be not speedily absorbed.

When the thorax has been violently contused, the heart, lungs, and large blood-velifs within the chest, are liable to partake of the injury; or a rib may be fractured, and may pierce the lungs, so s to occasion alarming confquences, if not death itself.

A general contusion of the abdomen, or a blow received upon it, may perhaps hurt the liver, stomach, uterus, bowels, &c. or may rupture an important blood-velff, and thus cause the death of the patient by the internal bleeding, inflammation, or luppuration.

The judicious surgeon will therefore, in such cases, con-
ider what internal parts are likely to have sustained an in-
jury, and will adapt his means to the peculiar circumstances which arise. See Concus5ion, Fracture, and Hemorrhage.

CONTWIG, in Geography, a small town of France, in the department of Mont-Tonne
e, and chief place of a canton in the district of Deux Ponts, with 780 inhabitants. The canton itself is composed of 16 communes, and reckons 4114 inhabitants.

CONY, a small town of France, on the river Seille, in the department of Sonme, 12 miles S.E. of Amiens, which formerly gave the title of pruce to the second line of the house of Bourbon Condé. It has only 759 inhabitants, but is the chief place of a canton, which, in 27 communes, and upon a territorial extent of 220 kilometres, reckons 6775 persons, and forms part of the district of Amiens; 3/4 leagues N.N.E. of it.

CONZ, a small town of France, in the department of Sarre, and chief place of a canton in the district of Treves. The number of its inhabitants does not exceed 351, and the whole canton has 31 communes, and a popula-
tion of 4972 individuals.

CONTZEN, Adam, in Biography, a Jesuit, and native of the duchy of St. Juliers, has been celebrated for his deep knowledge in the learned languages which he taught in the college of Munich, where he died in the year 1637, after having published "Commentarii in Evangelia in Epit.
Pauli ad Rom. et ad Corinth."
2 tom. fol. He wrote
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Gen. Ch. Cal. none. Cor. monocarpous, bell, funnel, or wheel-shaped, smooth, more or less deeply fix-eleft; segments open or reflexed. Stigm. Filaments fix, awl-shaped, inserted into the corolla or the receptacle; anthers oblong, erect. Fil. Germ superior, globular; stig. trilobed, trigorous. Peric. Berry globular, spotted before it ripens, three-celled. Seeds one, two, or more in each cell, one or two of the cells frequently abortive.


* Corollas bell-flowered. Lilium convalium, Tourn.


** Corollas funnel-flowered. Polygonatum, Tourn.

4. C. verticillata, narrow-leaved Solomon's seal. Linn. Sp.Fl. 2. Mart. 4. Poir. 4. Wildl. 4. Eng. Bot. 138. (Polygonatum; Hall. n. 1344. P. angustifolium non ramosum; Bauh. Pin. 393. Tourn. Inf. 79. P. ramosum; Bauh. Pin. 304.) "Leaves in whorls." Root perennial, scoriaceous, erect. Stems two feet high, erect, commonly simple, angular, smooth, naked near the bottom. Leaves three or four in a whorl, five or seven at the top of the stem; lanceolate, acute, fleshy, glaucous underneath; stipules none. Flowers white, green at the tip; pedicels axillary, solitary, slender, branched, drooping, two or three-flowered; corolla a little narrowed at the mouth of the tube; divisions bearded within the tube, rather obtuse; stamens short, inserted into the mouth of the tube; style short. Berry globular, blue. There is a branched variety, described by Cufius and others as a distinct species. A native of many parts of Europe, of Scotland, but not of England. 5. C. polygonatum, angular Solomon's seal. Linn. Sp.Fl. 3. Mart. 5. Poir. 5. Wildl. 5. Flor. Dan. tab. 377. Eng. Bot. 280. Woodw. Med. Bot. tab. 44. (Polygonatum latifolium vulgare; Tourn. Inf. 78. Hall. Hab. n. 1342. P. latifolium bore majore odor; Bauh. Pin. 393. Barcel. 1.c. 711.) "Leaves alternate, half-embracing the stem; stem angular; pedicels axillary, generally one-flowered." Root perennial, creeping, scoriaceous, full of knots, which, when cut obliquely, are figured with veins, with f-some of what of the appearance of a feal, whence it is said to have obtained the name of Solomon's seal. Stems several, a foot and half high, erect, nodding at the top, simple, leafy half way down, angular, f-some of which two-edged, zigzag, smooth. Leaves nerved, smooth, unilateral. Flowers white, with a green line down the segments, nodding, sweet-scented; * unilateral on the side opposite the flowers; pedicels axillary, solitary or in pairs, almost always one-flowered; corolla oblong, a little narrowed in the middle; divisions spreading, bearded; stigmas inserted into the middle of the tube; anthers project beyond the base of the divisions; style half an inch long. Berry blue, with three seeds. A native of England and other parts of Europe. The root is mucilaginous, and forms of sincerity have been made into bread. It has long been employed in a dermatological poultice to various kinds of tumours, but more particularly to bruises, accompanied with extravasation of blood in the cellular membrane. It is also recommended as a cosmetic; and in the time of Galen was used by women to remove pimples and freckles of the skin. The berries, flowers, and leaves are extremely acrid, and said to be poisonous; but Point has often seen the young shoots in spring and found them as tender and wholesome as those of asparagus. 6. C. multi-flora.
**Corolla large, open, filiform, divided almost to the bottom; segments linear, obtuse, filaments half the length of the corolla; filaments capillary; anthers yellow, small, roundish; style the length of the filaments; stigma obtuse. Berries red. A native of North America. 11. C. trifolium. Linn. Sp. Pl. 7. Mart. 10. Poir. 11. Willd. 10. (C. floribunda racemosum, folis ovalis oblongis; Gmel. Sib. 1. tab. 6.) "Leaves embracing the stem, in three; raceme terminal, simple." Root perennial, much, jointed, knotty, with short slender filaments at each joint. Stem about three or four inches high, slender, crooked. Leaves generally three-foliate, rather acute, even-surfaced, imbricate, green on both sides. Flowers small, on long simple peduncles; corolla open, deeply divided; divisions ovate-acute; filaments very short, inserted into the receptacle; gynoecium. Berries red, round. Seeds three or yellowish, compressed, pointed. A native of the forests in Siberia. 12. C. bifolia. Linn. Sp. Pl. 8. Mart 11. Poir. 12. Willd. 11. (Polygonatum multiflorum; Gmel. Sp. Pl. 311.) "Leaves heart-shaped; flowers tetradynamous." Root perennial, small, fibrous, creeping. Root-leaves solitary, on long petioles, springing from filament parts of the root. Stem from a different part of the root, two or three inches high, slender, slightly angular. Stem leaves generally two-petioled, a little nerved, heart-shaped, acute, with two rounded lobes and some fine hairs at the base. Flowers white, small, shorter than the peduncles; peduncles very slender, quite simple, sometimes two together, from the axil of a small scale at the base; corolla deeply four-lobed; filaments long; anthers small, shorter than the corolla; style short, thick; stigma flabellate, bifid. Berries red, small, two or three-celled. A native of the mountainous parts of Europe, abundant in Sweden. Poiret observes that the petioled leaves are a rare singularity in the family of the Liliaceae.

**Propagation and Culture.—The lily of the valley requires a loose sandy soil and a shady situation. It is propagated by parting the roots in autumn, placing the fets a foot or more apart. This should be done every third or fourth year; their flowers will else be small and few. All the sorts of Solomon's seal are hardy. They prefer a light soil and a shady situation, and are proper to ornament plantations which are not crowded with shrubs. They are propagated in the same manner and require the same treatment as the lily of the valley. Miller.

**CONVENTES, in Ancient Geography, a people of Gaul, who derived their name from the Latin convenire. They were established by Pompey, after his return from the Spanish war, against Sertorius, at the foot of the Pyrenees. Their country is Comingens.

**CONVENT from the Latin convenire, meaning, of convenire, to come together; a multitude of religious, of either sex. See MONASTERY.

Convents are very numerous in Greece, as well as in many Popish countries; and they are generally, though not universally, sanctuaries confected to ignorance, superstition, and most frequently to sloth. In the Grecian states, the monks are denominated calypers, from καλυπτεῖν, καλύπτειν, good, and γενέας, geinæas, old man, a good old man. However, the Grecian convents are the habitations, not merely of old men, but of young boys, from 10 to 12 years of age, clothed in the habit, which consists of a plain long black gown, confined by a girdle.

**CONVENTA PACTA. See PACTA.

**CONVENTI, Giulio Cesare, in Biography, a Bolog.-
nef sculptor, who is spoken of in high terms by Malvafia, in his description of the magnificent funeral of Agostino Caracci, upon which occasion Conventi modelled a beautiful figure of virtue, which, with another, personifying honour, was represented, crowning with laurel, the bolt of the deceased artist. The celebrated sculptor, Algardi, received his first instruction in modelling from this master. Malvafia.

CONVENTICLE, a diminutive of conven, denoting, properly, a cabal, or secret assembly, of a part of the monks of a convent, to make a brige or party in the election of an abbot.

From the ill use of these assemblies, the word is come into disrepute; and now stands for any mischievous, seditions, or irregular assembly. F. Doutin observes, the accidental always extenuated the fifth general council an unlawful conventicle. The term conventicle is said, by some, to have been first applied in England to the schools of Wickliff, and has been since used to signify the religious assemblies of all in this country, who do not conform to the established doctrines and worship of the church of England.

Conventicle, however, in strict propriety, denotes an unlawful assembly; and cannot, therefore, be justly applied to the legal assemblies of protestant dissenters, in places of worship certified, or licensed, according to the regulations of law. See Toleration.

This term occurs in the statutes 2 Hen. IV. c. 15, and 1 Hen. VI. c. 3; and 16 Car. II. c. 4. (A.D. 1664), which statute was made to prevent and suppress conventicles. This statute, which was enacted for three years, having expired, was revived A.D. 1670, by 22 Car. II. c. 1., which enacted, that if any person of the age of fifteen years, subjects of this kingdom, shall be present at any conventicle, where there are five or more assembled, they shall be fined 5s. for the first offence, and 10s. for the second, and performing, or maintaining incur a penalty of 20l. for the first, and 40l. for the second offence. Also, suffering a meeting to be held in a house, &c. is liable to 20l. penalty. Julices of peace, on the oath of two witnesses, or any other sufficient proof, may record the offence under their hands and seals, and this record shall be taken in law for a full and perfect conviction, and shall be certified at the next quarter-sessions. They, and also confables, head boroughs, &c. have power to enter such houses, and seize persons assembled, &c. And if they neglect their duty, they shall forfeit 100l. And if any confable, &c. know of such meetings, and do not inform a justice of peace, or chief magistrate, &c. he shall forfeit 5l.

"One clauae in this act," says Mr. Hume (Hist. vol. vii. p. 457,) "is remarkable; that if any dispute should arise with regard to the interpretation of any part of the act, the judges should always explain the doubt in the sense least favourable to conventicles; it being the intention of parliament entirely to suppress them. Such was the zeal of the commons, that they violated the plainest and most established maxims of civil policy, which require, that in all criminal prosecutions, favour should always be given to the prisoner." The persecution under this act continued to be so severe, till the operation of the act was suspended by the exercice of a dissenting power, and the king's declaration of indulgence, A.D. 1671–2. However, alderman Love, member for the city of London, in the name of the dissenters, disavowed the dissenting power, though it had been exercised in their favour, because, as he declared in his speech, "he had rather go without his own defined liberty, than have it in a way so destructive of the liberties of his country, and the protestant interest: and this (he said) was the sence of the main body of dissenters." At length it was ordained by the lat. 1 W. & M. R. 1. c. 18, that protestant dissenters shall be exempted from penalties; though if they meet in a house with the doors locked, barred, or bolted, such dissenters shall have no benefit from that statute. By lat. 10 Anne, c. 2. officers of the government, &c. present at any conventicle, at which there shall be ten persons, if the royal family be not presently for express words, shall forfeit 40l. and be disabled. See Nonconformists and Toleration.

CONVENTION, in our Law-Books, is used when a parliament is called, which fits and is dissolved without any act passed, or judgment given. It is then said not to be a session of parliament, but a convention. See Convention infra.

Convention of Rouen, the fame with burse of Rouen. Convention, a treaty, contract, or agreement between two or more parties. See Contract.

Every convention between men, provided it be not contrary to honnely, and good manners, produces a natural obligation, and makes the performance a point of confidence.

Every convention has either a name, and a cause or consideration, or it has none: in the first case, it obliges civilly and naturally; in the latter only naturally.

Conventions entre fouverains pour restitution des defercurs, conventions among sovereigns for restitution of dissenters. By these sorts of conventions, the dissenters from all armies are taken up or arrested, if they get into the territories of a power, that is in agreement with that whole colours they have defected. Notice is given to the nearest commandant, who should fend people to find the dissenters at the expense of the corps, and should pay those who took them up, for their suffrance or support during the time of their detention.

Convention fercretes entre les officers d'un corps, secret conventions among the officers of a corps. See Concordat.

Secret conventions are also made in a treaty of peace, reciprocally agreed on, and concluded between the parties, who have received powers to treat. Then these conventions remain secret and concealed, till what was agreed on between the treating and contracting parties is put in execution.

Convention is much used both in ancient and modern pleadings, for an agreement or covenant.

In the book of rolls of the manor of Hatfield in Yorkshire, we have a record of a plesant convention, anno 11 Edw. III. between Robert de Roderham, and John de Ithen; the latter of whom sold the devil in a feering for three-pence halfpenny to the former, to be delivered on the fourth day after the convention; when, the purchaser making his demand, the seller refused to give him livery, to the great loss (as the record represents it), of forty shillings to the purchaser, &c. But it appearing to the court, that such a plea does not lie among Christians, the parties were adjourned to hell for judgment.

Convention is also the name given to an extraordinary assembly of parliament, or of the states of the realm, held without the king's writ. Of this kind was the parliament which restored Charles II. This parliament met above a month before his return, the lords by their own authority, and the commons, in pursuance of writs issued in the name of the keepers of the liberty of England, by authority of parliament; and sat full seven months after his restoration, and enacted several laws still in force.

The
The necessity of the case, in this instance, superseded all law; for if they had not so met, it was morally impossible that the kingdom should have been settled in peace. After the king's return, the first thing that was done, was to pass an act, declaring this to be a good parliament, notwithstanding the defect of the king's writs. (Stat. 12 Car. II. c. 1.) Nevertheless, though the king himself, who alone had a right to object, consented to waive the objection, it was at that time a great doubt among the lawyers (1 Sid. 1.) whether even this healing act made it a good parliament, and held by very many, says Judge Blackstone, in the negative: though, as he adds, it seems to have been too nice a scruple. And yet, out of abundant caution, it was thought necessary to continue its acts and sit in the next parliament, by statute 13 Car. II. c. 7. & c. 14.

The convention of estates, in 1688, after the retreat of king James II. upon mature deliberation, came to a conclusion, that king James, by his practices here, and his flight hence, had abdicated the kingdom; and that the throne was vacant; and therefore devoted to king William and queen Mary. Upon this their assembly expired as a convention, and was converted into a parliament.

In this case, the lords and commons, by their own authority, and upon the summons of the prince of Orange (afterwards king William) met in a convention, and therein disposed of the king and the kingdom. On this occasion, the peers and bishops, to the number of near 90, addressed the prince, desiring him to summon a convention by circular letters. In order to satyfy his mind by a more general and express declaration of the public consent, the following judicious expedient was adopted. All the members who had litten in the House of Commons during any parliament of Charles II., were invited to meet; and to them were added the mayors, aldermen, and fifty of the common council of London. This was regarded as the most proper representative of the people that could be summoned during the present emergency. They unanimously voted the same address with the lords. The prince, being thus supported by all the legal authority which could possibly be obtained in this critical conjuncture, wrote circular letters to the counties and corporations of England, and his orders were universally complied with. Accordingly, the English convention was assembled, June 22, 1689, and a vote was passed in a few days by a great majority of the commons, and sent up to the peers for their concurrence. The words which expressed it were these, "that king James II. having endeavoured to subvert the constitution of the kingdom, by breaking the original contract between king and people; and having, by the advice of Jesuits, and other wicked persons, violated the fundamental laws, and withdrawn himself out of the kingdom, has abdicated the government, and that the throne is thereby vacant." (See Abdication.) The vote was carried to the upper house, and there met with great opposition. After long debate, and free conference between the houses, and after having obtained the sentiments of the prince, with regard to the settlement of the government, the chief parties agreed, and the convention passed a bill; in which they settled the crown on the prince and princes of Orange; the sole administration to remain in the prince: the princes of Denmark to succeed after the death of the prince and princes of Orange; her posterity after those of the princes, but before those of the prince by any other wife. The convention annexed to this settlement of the crown, a declaration of rights, where all the points which had of late years been disputed between the king and people, were finally determined; and the powers of royal prerogative were more narrowly circumscribed, and more exactly defined, than in any former period of the English government. See Constitution.

This convention was assembled upon a similar principle of necessity with that of the restoration; that is, upon a full conviction, that king James had abdicated the government, and that the throne was thereby vacant; which supposition of the individual members was confirmed by their concurrent resolution, when they actually assembled. In such a case as the palpable vacancy of the throne, it follows "ex necessitate rei," that the form of the royal writs must be laid aside, otherwise no parliament can ever meet again. Let us suppose, for the sake of argument, that the whole royal line should at any time fail, and become extinct, which would indispensably vacate the throne; in this situation, it seems reasonable to presume, that the body of the nation, consisting of lords and commons, would have a right to meet and settle the government, otherwise there must be no government at all. Upon this, and no other principle, says Judge Blackstone, did the convention in 1689 assemble. The vacancy of the throne was precedent to their meeting, without any royal summons, not in consequence of it. They did not assemble without writ, and then make the throne vacant; but, the throne being previously vacant by the king's abdication, they assembled without writ, as they must do if they assembled at all. Had the throne been full, their meeting would not have been regular; but, as it was really empty, such meeting became absolutely necessary. Accordingly, it is declared by statute 1 W. & M. R. 1. c. 1. that this convention was really the two houses of parliament, notwithstanding the want of writs, or other defects of form.

In a similar convention, by circular letters from the prince, was summoned at Edinburgh, on the 22d of March 1689. As soon as the purpose of this convention was discovered, the earl of Balcarres, and vicount Dundee, leaders of the tories, withdrew from the city; and the convention having passed a bold and decisive vote, that king James, by his mal-administration and abuse of power, had forfeited all title to the crown, they made a tender of the royal dignity to the prince and princes of Orange.

The constitution of Great Britain having placed the representation of the nation, and the expression of the national will in the parliament, no other meeting or convention, even of every individual in the kingdom, would be a competent organ to express that will; and meetings of such a nature tending merely to sedition, and to delude the people into an imaginary assertion of rights, which they had before delegated to their representatives in parliament, could only tend to anarchy and confusion; and to overturn every settled principle of government.

Accordingly, an act of parliament was passed in Ireland, in the year 1793, to prevent any such meetings or conventions; and a few ignorant individuals, who in the same year had dared to assemble under that title in Scotland, were quickly dispersed, and their leaders convicted of sedition and practices; for which they were sentenced to transportation.

CONVENTIONAL Estates for Life, are those that are expressly created by the acts of the parties, in contradistinction to such as are merely legal, or enacted by construction and operation of law. See Estate.

Conventional Subrogation. See Subrogation.

CONVENTIONARY RENTS, in Rural Economy, is a term which is sometimes applied to the reserved rents of life leases. See Lease.
CONVENTIONE FACIENDA, in Law, is a writ which lies for the breach of any covenant in writing. Fitzherbert calls it a writ of conventual.

CONVENTUAL, something belonging to a convent See Conventile.

Conventual is particularly used, since the year 1559, for a religious who actually resides in a convent; in contradiction to those who are only guests, or are entertained there, or are in possession of benefices depending on the house.

Conventual likewise denotes a class of the order of Franciscans, who adopted the relaxation introduced into that order by pope Innocent IV, which allowed of property and possessions in their community. They were so called in opposition to the "Brethren of the Observance." This division took place in the year 1368.

Conventual Churcb, denotes a church that consists of regular clerks, professing some order of religion; or of dean and chapter, or other societies of spiritual men.

Conventual Prior, differs from a clausal prior, in that the former has the full right and authority of an abbett; the only difference between them being in the name; whereas the clausal prior is a dependent of the abbett, and derives all his authority from him.

The conventual prior is obliged to take priests' orders in a year, or at most in two years, from the day of his admission: in default whereof, the benefice becomes vacant. Some priories are actually conventual, i.e. they are flocked with religious: others are only conventual in habit, qu. gr. where there have been no religious during the space of forty years: the continuance of one single religious, keeps the priory conventual actus; for, in default of one, the priory becomes simple. See Prior.

By a declaration of the king of France, in 1668, it was decided, that a conventility never degenerates, or ceases, while there are regular places subsisting in it for twelve religious, with revenues for their support.

Conventual Auditor. See Auditor.

Convergency of Meridians, in Geographical Surveying, is the angle formed between the meridian of any place and the parallel to the meridian of any other place, drawn through the first mentioned place. Thus, if P (Plate II. Surveying, fig. 10.) be the pole of the earth, E Q a portion of the equator, P E a meridian drawn through a place or station G, and P Q a meridian drawn through another place R: then, if G R be a portion of a great circle passing through the places G and R, and a b be a portion of a small circle passing through G, parallel to the meridian of R (P Q), or perpendicular to the great circle a R, which is itself a perpendicular to the meridian P Q, in the point R, then is the angle a G P the angle of convergence of the two meridians P G and P R, at the place G. It is to be observed, that at the equator any two meridians, as E P and Q P, are parallel to each other; but on their departure from thence, they converge more and more as they approach towards the pole, where the angle of convergence (a G P) becomes equal to the angle of longitude E Q. It may also be remarked, that the angle of convergence, augmented by the excess of the three angles of a spherical triangle above 180°, is equal to the angle of longitude at the pole, on a sphere.

Phil. Trans. 1787, p. 218. The principles for applying this to an ellipsoïd figure of the earth, or to any other given spheroid, may be found in Mudge and Dalby's Trig. Survey, vol. i. art. 60, &c.

The late general Roy (Phil. Trans. 1787, p. 216.) has explained the mode of applying the convergency of two meridians, obtained by reciprocally observing the azimuth of a station on each, from the other, compared with the meridian there (determined by observations of the pole-star), to the finding of the difference of longitude, or angle at the pole between the meridians of those two stations, by a method somewhat different from that recommended by the Rev. Mr. Mitchell. Phil. Trans. lvi. In the progress of the Government Trigonometrical Survey, this method was first applied in the finding of the difference of longitude between Botley Hill station in Surrey (lat. 51° 10' 41" N. and long. 6° 8' 3" E. of Greenwich Royal Observatory) and Goudhurst steeple in Kent, about 23 miles distant; as also for setting the latitude of the latter place. Phil. Trans. 1790, p. 266. It was afterwards applied, in a not complete manner, to the determination of the difference of longitude between Beachy Head station in Sussex (lat. 50° 44' 23.7", long. 0° 15' 11.6" E.), and Dunnofe station in the Isle of Wight, wherein the bearing of each of these places, with the meridian of the other, was accurately fettled by observation, although the places are more than 64 miles apart; and whereas, the length of a degree of a great circle of the earth, perpendicular to the meridian in latitude 50° 41', was calculated to be 61182.3 English fathoms. The latitude of Dunnofe station, as determined by this operation, has since been verified by a series of accurate observations, made with a capital zenith fector, the last work of the celebrated Ramden, and has been found to err only 3% of a second in defect. See Dunnofe. This method of determining longitudes of stations, by the convergency of meridians, has since been applied to finding the longitudes and latitudes of Black-Down station in Dorsetshire, long. 2° 32' 22.4" W, lat. 51° 41' 14.7" N. of Butterston station in Devonshire, long. 3° 52' 47.5", lat. 50° 24'. 47' 3", and of St. Agnes Beacon in Cornwall, long. 3° 11' 55.7", and lat. 50° 18' 27.9'. Phil. Trans. 1805. But these deductions seem not to have all the pretensions to accuracy, of which the method is susceptible, for want of inaugural observations; the three last stations being so chosen as to be all visible from each other: and although the first of them is visible from Dunnofe, that station was not visited again, for the purpose of completing the observations; but one of the angles of this, and both the angles of the other two polar triangles, were made to depend on those of the intermediate chains of triangles. It is with the utmost regret that we observe any opportunities omitted of submitting this grand trigonometrical survey to all the possible tests of its accuracy, or of collecting and recording observations, likely to be of future use in drawing conclusions relative to the anomalies in the figure of the earth. The writer of this, from having affitied in the making of some hundreds of observations with the admirable theodolites, which are in the hands of major William Mudge, and his able affiliates employed on the trigonometrical survey, and from having been a witnes to the great skill and pains with which they are always used by their gentlemen, and from having twice applied his multiplied observations in accurately calculating the situation of many different objects, by series of 4 or 5, and in some cases 10 or 12, independent triangles, is enabled to assert, that an extreme degree of accuracy in the distances and horizontal angles may be obtained in this survey, perhaps unparalleled in any familiar undertaking. He lauds, therefore, that Ramden's fine zenith sector (described Phil. Trans. 1803) should, during any favourable season of the year, lie idle in the Tower, instead of being employed in determining the actual latitudes, and, with a theodolite, making pole-star observations, for obtaining the correct azimuths of all the many principal
principal stations, whose horizontal bearings and distances have been very accurately &tit in this suv.'y; which does equal honour to the government that patronizes it, and to the gentlemen by whom it is conducted.

CONVERGING CURVES. See Curve.

CONVERGING, OF CONVERGENT Lines, in Geometry, are those which continually approximate, or whose distance becomes continually less and less; in opposition to divergent lines, whose distance becomes continually greater. Lines that converge one way, diverge the other.

CONVERGING Rays, in Optics, are those rays which in their passage out of one medium into another, of a different density, are refracted towards one another; so that, if far enough continued, they will meet in a point, or focus.

All convex lenses make the rays converge, and concave ones diverge, i.e. the one inflects them towards a centre, and the other deflects them from it; and the more, as such lenses are portions of smaller spheres. On which properties, all the effects of lenses, microscopes, telescopes, &c. depend.

Ray coming converging out of a denser medium into a rarer, become more convergent, and concur sooner than if they were to continue their motion through the first. Rays coming converging out of a rarer into a denser medium, converge less, and concur later, than if they had continued their motion through the first medium.

Parallel rays, passing from a denser into a rarer medium, v.g. from glafs into air, the surface of the glafs being towards the air, will become convergent, and concur in a focus.

Diverging rays, or rays coming from a point, under the same circumstances, become converging, and meet in a focus; and as the radiant point comes nearer, the focus recedes farther off; if the radiant be near, the focus will be infinitely distant; i.e. the rays will be parallel: and if the point be brought nearer still, the rays will diverge.

CONVERGING SERIES, in Mathematics. See Series.

CONVERSANO, in Geography, a town of Italy, in the kingdom of Naples, and province of Bari; the seat of a bishop, suffragan of Bari; 15 miles E.S.E. of it.

CONVERSATION, DISCOURSE; these two words denote an interchange between two, or among more persons: with this distinction, that the conversation is used for any general intercourse of sentiments whatever; whereas a discourse means a conversation limited to some particular subject. Thus we say, a conversable man; meaning a man able to converse on a variety of subjects, or a man of general knowledge; but we do not say a discoursable man. The word discourse is generally used when we mention a superior talking to an inferior.

CONVERSATION Point, in Geography, a head-land on the south side of a bay on the coast of California. N. lat. 32° 30'. W. long. 119°.

CONVERSATIONS, denote evening assemblies held at Rome, where persons of both sexes met, not for instructive or even amusing conversation, but in order to fee and pay transient compliments to one another; and where a person may enjoy the happiness of being squeezed and pressed among the ballet company in the city. Several of these take place in the same evening, and they are formed by the passing visits of the same persons, who thus seek amusement by a mere change of place and company. These assemblies generally break up about 9 o'clock; a small party expected, who are invited to supper. They resemble our modern routs. Moore's View of Society, &c. in Italy, vol. i. p. 337. &c.

CONVERSE, in Geometry, &c. A proposition is said to be the converse of another, when, after drawing a conclusion from something first supposed, we proceed to suppose what had been before concluded, and to draw from it what had been supposed. Thus, it is demonstrated in geometry, that if the two sides of a triangle be equal, the two angles opposite to those sides are equal also; the converse of the proposition is, that if the two angles of a triangle be equal, the two sides opposite to those angles are equal also.

CONVERSE Direction, in Astrology, is used in opposition to direct direction, i.e. by the latter, the promoter is carried to the significator, according to the order of the signs: but by the former it is carried from exalt to woe, contrary to the order of the signs.

CONVERSERO, in Geography, an island of the Adriatic, near the coast of Illyria. N. lat. 45° 20'. E. long. 15° 44'.

CONVERSION, in a Moral Sense, a return from evil to good; resulting from a change, either of the natural de
eformity of the one, and amissableness of the other; or of the advantages and disadvantages that spring from the one and the other, respectively.

Or, it is the change of the heart, with regard to the morals, passions, desires, and pursuits; and of the mind, with regard to the sentiments, &c. See REGENERATION. For an account of the conversion of St. Paul, considered as an argument for the truth of Christianity, see PAUL.

CONVERSION, in Law, is where a person having the goods of another in his possession, converts them to his own use, without consent of the owner; for which the proprietor may maintain an action of trover and conversion against him.

This action of trover and conversion was, in its original, an action of trustpafs upon the want, and a recovery of dammages against the offender, from which it derived its name. Refusal to restore goods is, prima facie, sufficient evidence of a conversion, though it does not amount to a conversion. See TRoVER.

CONVERSION, Converfo, in Logic, a circumstance or affection of propositions, wherein the order of the terms, or extremes, is changed; so that the subject enters into the place of the predicate, and the predicate into that of the subject; without any alteration in the quality of either.

As, "No virtue is vice;" we may derive "No vice is virtue;" in which we see the subject of the former, made the predicate of the latter, and the predicate subject; yet both true.

Conversion is usually defined a due change of the order of the extremes, i.e. under such a habitude and coherence with respect to each other, that the one is rightly inferred from the other.

Hence, in every legitimate conversion, two things are required: 1. A communication, or reciprocation of terms; not in respect of words, but of order. 2. The inference of one proposition to the other.

Aristotle makes two kinds of conversion; the one simple, by others called universal; wherein nothing is changed beside the order of the extremes, i.e. the terms are transposed, without altering either the quality or quantity thereof: as, "No mind is body; No body is mind."

The second, per accidentu, called also particular; wherein, beside changing the places of the terms, there is a change of an universal sign into a particular one; as, "Every good man fludies the wefare of his country; some man that fludies the welfare of his country is good."

To these, some of A's followers add a third kind of conversion, called by contraposition; as, "Every man is an animal; every no-animal is no-man."
CONVERSION.

Conversion, in Rhetoric, &c. is understood of arguments which are returned, retorted, and shown on opposite sides, by changing the subject into the attribute, and the attribute into the subject.

There are conversions of arguments, from one figure to another, and also from general propositions to particular ones. Thus Cicero against Antony: "Doletis tres exercitus P. R. Interfectos? Interfect Antonius. Devidere clarissimos vivos? Et quos obvibus vivere Antonius. Authoritas hujus ordinis affixa est? Affixit Antonius."

Conversion, in War, denotes a military movement or manoeuvre, which turns the front of a battle, where the right or left flank was, when either flank is attacked.

Conversion of Diseases. A disease is said to be converted, when new symptoms arise in its progress, which require a different designation, and which either put a period to the original disorder, or, combining with it, alter the physician’s views respecting the proprieties, or the method of cure. Many instances of this kind are familiar; as the conversion of intermittent diseases into continued fevers, or obstructions of the viceria; of hemoptysis into phthisis; of jaundice into dropsy, and the like. Others are more unusual, and unexpected, and deserve to be noticed, because they occasion much perplexity in practice, when they occur, and especially as this subject has been much overlooked by medical writers.

We owe the first observation on the subject of conversion, to Hippocrates, and his annotators. Hoffmann has curiously touched on it, in his short dissertation de morborum transmutatione. Baglioli, though very cautious that it should be treated at length, and though liberal in promises of assistance, confines his recital of facts in a great measure to those of Hippocrates. An express treatise was written on the subject by Rodericus a Calefor, under the quaint title of Que ex Quibus, a work better conceived than executed. And an excellent essay was more recently published by Dr. Ferrar, of Manchester, in the 2d vol. of his "Medical Histories and Reflections," in which the substance of this article will be found.

This subject was formerly arranged under two divisions: when the original disease subsisted after the accession of the second, it was termed a case of epigenesis, or propagation; when the second disease put a period to the first, it was called an instance of metamorphosis, metaplasia, or transformation. But this is a loose distinction, which excludes many cases of conversion. The chief difference between the metamorphosis and epigenesis is, that the relation of the successive morbid appearances, and their dependence upon each other, cannot be so clearly perceived in one case as in the other. It would have been more useful, to have distinguished conversions by their influence on the event of the disease; Some are dangerous, and generally fatal; others, while they terminate the original disorder, conduct to a more speedy restoration of health. Thus, when a continued fever supervenes to pulmonary inflammation, the patient is in great danger, it is gravis malo grava noum accedere; when a diarrheæ supervenes to continued fever, in certain stages, it terminates the fever earlier than the regular course of the disease could have done.

All cases of conversion may perhaps be conveniently referred to the following heads. 1. The supervening disease may be produced by the remote causes of the original disorder: in this case, the action of those causes, after producing its first effect, is prolonged so as to excite a new train of symptoms. 2. The supervening disease may arise from the excess or combination of the symptoms of the original complaint. 3. The state of the habit, produced by the first disease, may give rise to a new disorder. 4. Conversion may happen, from the imprudent suppression of habitual diseases.

1. The application of certain remote causes, may be sufficiently powerful to produce a fresh disease, after the first has been brought on by their action. It is common to find pulmonary inflammation supervene to typhus, by a continuation of the application of cold or dampness, which operate as a remote cause of the fever. On the contrary, from the tendency of the system to inflammation, or from the manner in which cold has been applied, the pulmonary symptoms preceded the fever in some cases, and even run their course, before the fever assumes a regular form. In a fatal case of the conversion of pleurisy into typhus, the left lobe of the lung was destroyed by suppuration. (Luetaud. Hist. Nat. Med. tom. i. Obs. 378.) I have seen, says, Dr. Ferrar, a case of peripneumonia notha end in typhus, and the typhus in mania. He also relates, chiefly from his own observation, the conversion of acute rheumatism into typhus in the first week, a circumstance which we have also witnessed—the conversion of the mild febrifus, or typhus, into inflammation of the pelvis, or villous cost of the limbs;—of erysipelas into typhus;—of dysentery and diarrhœa into continued fever;—of hysteria into epilepsy and insanity, &c.; changes which are not very frequent.

Causes of hysteric convulsions, which belong to the head, are very common sources of error to young practitioners, and sometimes deceive even the most experienced. Sydenham long ago enumerated an ample catalogue of the diseases, the symptoms of which the maniac, hysteria, frequently affixes. This matterly essay, with which Dr. Ferrar appears to have been unacquainted, contains a full disclosure of the conversions of this disorder. The symptoms of apoplexy, paralysis, epilepsy, cough, the ipecac passion, jaundice, stone in the kidneys, and in the bladder, vomiting, diarrhœa, rheumatism, lumbago, &c. have been terminated by the accession of a complete hysteric paroxysm. (See Hystéria.) "We are ignorant," says Dr. Ferrar, who has described a similar variety of hysteric convulsions, "by what laws the body poifilles a power of representing the most hazardous disorders, without incurring danger; of counterfeiting the greatest derangement in the system, without materially altering its movements; of producing madness, confusions of its extravagancies, and of increasing the acuteness of sensation, oppressing the common fenfory. In hysteric affections, all these appearances are excited, which are incompatible with the realitions of every syphilist-maker, who has yet endeavoured to explain the inexplicable. Nature, as if in ridicule of the attempts to unmask her, has, in this class of diseases, reconciled contradictions, and realized impossibilities, with a mysterious veracity, which inspires the true philosopher with diffusion, and reduces the syllymatic to despair."

II. The symptoms of an idiopathic disease may, by their violence, affume the appearance, and require the attention due to a new complaint; or affections of particular viscera, which, in their incipient state, are only regarded as symptoms of general indisposition, may, as they gain ground, extinguish the original disease, or be prostrated beyond it. This head comprehends such a variety of cases, that to treat it fully, would be to give the history of all symptomatic diseases. A few illustrations will suffice.

Dr. Percival mentions, that he had seen an effusion into the cavities of the brain, produced by the succusions of coughing, in a confirmed pulmonary consumption, which effusion terminated fatally, with a previous suffocation, more than a week before death, of all the pulmonic symptoms.
CONVERSION.

It is one of the most perplexing occurrences in medicine, when the supervening disease is produced by a symptom of some latent complaint: when, for example, phthisical symptoms arise in a febrile or gouty patient, who exhibits, at first, no other appearance of those two diseases. Dr. Ferrar saw an instance, in which all the characters of confirmed phthisis pulmonalis were present, that terminated in recovery, upon the patient's coughing up some solid particles, which, upon examination, proved to be chalk-flakes. Dr. Percival relates, that a gentleman of rank was supposed to be in an advanced state, of what is called a galloping consumption, having an incessant cough, an expectoration apparently purulent, continued heats, and night sweats: yet his cure was accomplished by giving wine-and-cream copiously, and by administering doses of histhorn and specia. A gentle fit of the got was produced by this cordial regimen. The fever, cough, and spitting, were progressively diminished, and the health of the patient was soon perfectly re-established.

There is, indeed, a strong resemblance between hysteria and gout, in the power of counterfeiting different diseases, but with this material distinction; that the hysterical representations are commonly void of danger, while those produced by gout are often more dangerous than the simple disorder which they imitate. The hysterical hemoptysis, for example, is seldom productive of bad conseqences, but the arthritic apoplexy, pneumonia, and cardialgia, are much more alarming, and run their course quicker than similar complaints originating from other causes. But these diseases agree in this respect, that the accession of the regular paroxysm puts a favourable period to the irregular symptoms.

The prognostics, in conversions of this second class, must evidently vary according to the fact and degree of the supervening disease, and its favourable action upon the original disorder.

III. The original disease, if acute, when it has run its usual course, may leave the habit in a fertile situation to the production of another disease: or if the original be a chronic disease, such a state of the habit may take place during its continuance, and the accretion disease may be simply superadded, or it may vary the form, or affect the duration of the former.

Continued fevers are converted into different diseases, the production of which admits one general explanation. During the increased action of the circulating system, if any part of the body be originally weak, or have been rendered infirm and irritable by preceding disease, congestion, and its consequences, may be expected there. It is therefore easy to conceive, why one patient should suffer a paralytic affection, another phthisis, or a third nephritis, in consequence of tenacious cafes of phthis. The glaudiar suppurations, consequent on fevers, seem to depend on the same principle; for although they are represented as critical, by the older medical writers, we sometimes see striking proofs of the contrary. The exanthemata are frequently converted into ulcers, which become both chronic and dangerous. The small-pox often produces severe coughs, diarrhoea, and opthalmia. In some rare instances, tumours of the joints supervene, which suppurate and destroy the patient. The pneumatic inflammation attending the measles, is too often converted into phthisis pulmonalis. Glandular swellings, and general dropsy, frequently succeed the scarlatina anginosa. There is a curious case in Dr. Percival's Essays, Medical and Experimental, vol. i. p. 148, of a woman, in whom a conversion of fever took place, first into palsy, afterwards into epilepsy, and then into amaurosis. Fevers often terminate in hysterical disorders, especially in women. Nephritis also is a common conversion of fever; it seldom supervenes with considerable violence, excepting in persons who have formerly undergone it; but when it has been familiar to the patient, a very large quantity of gravel is commonly passed, with extraordinary pain in the state of conversion. The accession of nephritis always extinguishes the fever. Other conversions of fever have been noticed, some of them peculiar to certain epidemics.

Various instances of conversion of diseases, under this head, may be found in the writings of physicians. Jaundice is said, by Baglivi, to be converted to typhomacent; typhomacent, by Dr. Ferrar, to diarrhoea and scrophula; dyspeptic complaints of long standing, to general dropsy; seizes to chronic inflammation of the bowels, and diarrhœa, which generally prove fatal; mania, as observed by Dr. Mead, to fatal epilepsy; and also to a cutaneous eruption, with recovery; &c. &c.

IV. Conversions may arise, when a disease, regular in its usual course, or long familiar to the habit, is violently terminated by improper methods, or suddenly extinguished by accidental circumstances.

Thus epileptic fits have been produced by the retroception of the itch, in consequence of some external application; the epilepsy having refited all the usual methods of treatment, was only cured by producing the itch. Instances of the production of melancholy and madness, by the suppresion of eruptions, or the healing of old ulcers, and habitual drains, are common in practical writers.

The diseases originating from the suppression of the menstrual and humoral discharges are also well explained in different books. Dr. Hoffman's treatise, De Membra tum Temporisation, relates almost entirely to this class of disorders. Tenedious dyspeptic cafes are often converted to cutaneous eruptions, in distinct pimples, of a bright red colour; such eruptions extinguish the complaint in the stomach. Examples of conversions might be multiplied infinitely: but we must here content ourselves with advertting to the important conclusions, respecting the prognostics and cure of diseases, which may be drawn from an observation of those phenomena. The following most obvious deductions have been pointed out and illustrated by Dr. Ferrar.

1. Whenever local inflammation supervenes to an acute disease, it shortens or extinguishes the original disorder. The danger, or falsity of this conversion, appears to depend greatly on the nature of the part attacked by inflammation. In fever, for instance, if it be a conglomerate or conglomerate gland, the process will be favourable, but if the brain, the pleura, or the peritoneum, be inflamed, the danger is increased. In the former case, the cure of the fever may be in a great measure trusted to the supervening disease; in the latter, the progress of the inflammation will demand our chief attention. Thus, however, contra-indications will be avoided, and the safety of the patient will be better consulted, than by the temporizing practice usually adopted on such occasions.

This deduction serves also to explain the action of bilifers, which, by producing local inflammation, imitate the process, and, in proportion to their action, exhibit the effect of this kind of conversion. It explains also the falsity of the gouty inflammation, when it seizes a part not necessary to life.

3. It is far certain, that medicines operate by producing conversions, that we perceive very considerable differences resulting from the use of certain remedies, such as mercury, and we judge of the extinction of the original complaint, in some measure, by the increase and permanency of the
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remedial diseased. Thus when we give diuretics, or cathartics, we
endeavour to excite a disease in the intestines, or kidneys; for an extreme increase of natural action, in any
part, is certainly morbid. In like manner, Dr. Darwin has
observed, that some rearrangements of mind cannot be
removed, without exciting an artificial delirium.

3. The convulsion denominated hysterical, when it seizes
the muscular fibre, in cases of convulsion, is always salutary,
and may be regarded, in many instances, as the crisis of
chronic disorders.

4. Internal inflammation, supervening to chronic diseases,
have a left tendency to extinguish the original complaint,
than a similar formation of acute disorders, and is equally
dangerous.

5. Cutaneous eruptions often extinguish dangerous dis-
eases. Excepting the regular exanthemata, such conver-
sions seldom happen in acute disorders. But madness and
melancholy, epilepsy, delirium, protracted after fever, dys-
pepsia, various pulmonary affections, are all observed to be
mitigated, or removed, on the appearance of cutaneous
diseases; especially on the return of those, which, after
becoming familiar, had been suddenly suppressed.

6. As it appears that many conversions are proc Moments,
constituted by nature for the cure of diseases, and that of
the most active remedies operate in a similar manner, we
may not only improve the history of diseases, but the prac-
tice of medicine, by paying closer attention to the con-
nection and operation of disorders upon each other.

With this view of the subject, the most complicated cases will
admit an instructive development, and every additional fact may find an useful place. See METASTASIS.

Conversion of equations, in Algebra, is when the quantity
sought, or any part thereof, being in fractions, the whole
is reduced to one common denomination; and then,
ombitting the denominators, the equation is continued in the
numerators only.

Thus, suppose \( a-b = \frac{a+b}{d} \); multiply all by \( d \),
and it will stand thus, \( da-db=aa+ce+db+db \).

In arithmetic, we use the term proportion by conversion of
ratio, for a comparison of the antecedent, and consequent, in
two equal ratios.

Thus, as there is the same ratio between two and three,
as between eight and twelve; it is concluded there is the
same ratio between two and one, as between eight and four.

Or, according to Euclid (ib. v. Def. 17.), it is the in-
fERENCE, in the case of four proportions, that the first is to
its excess above the second, as the third is to its excess
above the fourth.

E.G. If we have \( - - - - - - - : 6 : 6 : 4 : 3 \).

Then convertendo, or by conversion, \( 8 : 2 : 4 : 1 \).

Or, if we have \( - - - - : 6 : 6 : 4 : 3 \).

Thus convertendo \( - - - - - - - : a-b : c : c \).

Conversion, Centre of. See CENTRE.

CONVERSOS. See CONVERT.

CONVET, a person who has undergone Conver-
sion.

CONVERT is chiefly used in respect of changes from one
religion, or religious sect, to another.

Converts with relation to the religion turned to, are
denominated apostates with regard to that they have relin-
quished.

The Jews, formerly converted to Christianity in England,
were called conversos. Henry III. built them a house in
London, and allowed them a competent subsistence for their
lives; which house was called domus convertorum. But the
number afterwards increasing, they became a burthen to the
crown upon which they were distributed among the
monasteries: and after the expulsion of the Jews under
Edward III. the domus conversorum was given for keeping
of the rolls.

CONVERTS, in a Monastic Sense, are lay-friars, or brothers,
admitted for the service of the house; without orders, and
not allowed to sing in the choir.

Till the eleventh century, the word was used for persons
who embraced the monastic life at the age of discretion; by
which they were distinguished from those devoted in their
childhood by their parents, called aliens.

But in the eleventh century, when they began to receive
into monasteries illustrious persons, incapable of being clerks,
and only destined for bodily labour; the signification of the
word was necessarily changed. F. Mabillon observes, that it
was John, first abbot of Vallombrosa, who first introduced
these brother-converts, distinguished by their right from the
monks of the choir, who were then either clerks, or capable of
becoming so.

CONVERTIBILITY of elements into one another. See ELEMENTS.

CONVERTIBILITY of spirits into one another. See SPI-
RITU AL

CONVERTIBLE Husbaniry, in Agriculture, is that
fort of farm-management in which the land is cultivated,
under the alternate systems of tillage and grafs.

The lands which are the most proper for this kind of
husbandry are those in which the soil is of the more dry and
frangible description, and in which there is a disposition
to take on or produce grafs. Wet clayey soils are confidered by
Mr. Davis as wholly unfit for this fort of management. All
the loamy forts of land which are capable of producing good
turnips, and the rich sandy soils, are particularly fitted to
this method of husbandry. And on many other varieties of
land it may be had recourse to with considerable benefit and
advantage, where proper care is taken in the cultivation;
but it is unquestionably a mode of culture which flands in
need of great attention, in order to conduct it in the most
proper and beneficial manner, both for the land and the
farmer.

It has however been observed by Mr. Nairmirth, in his
"Elements of Agriculture," that "though it is possible
to make drill culture universal, and cultivate the whole
country like a garden, it is doubtful if it would be provi-
dent." It is to be feared that it would be something like the
conduct of a person who consumes part of his capital yearly,
along with his annual revenue. Whatever may be said to
the contrary, all soils certainly suffer some degree of deterio-
ratiou by long, unremitted tillage. When divested of that
cloting with which nature always defends it if undisturbed,
and when turned up naked to abide the force of the blight,
the happy medium of confluence is deranged, its heat par-
ticles carried away in torrents; and it is left a feebly skeleton,
poisoning only the faint semblance of departed fertility. This
is strongly exemplified, he says, in the once fertile island of Bar-
badoes, in the West Indies. It has been said that this island,
no doubt somewhat hyperbolically, since it began to be
cultivated by the Europeans, has loaded more wivels with
produce than would have been sufficient to have carried
away the whole island; and now, it is reported, that the
soil is so exhausted, that no kind of culture or manure can
restore its fertility. We have correspondent accounts from
the county of Norfolk, and other districts, where unceasing
tillage has been practised; the species of crop which has been
most run upon is now less productive than formerly. In short,
there are numerous inuiances within the personal knowledge
of many, that wherever the ground has been long dunged and laboured for cropping, without rest, though the crops may be as bulky, they are generally less productive than they were at an earlier period.

Converted husbandry, or regular alternations of tillage crops and pastures, seem therefore, he says, to be the only system by which the fertility of the country can be preserved and improved. The provisions of a country are not derived from tillage crops alone. A considerable proportion is obtained from the dairy and the flocks. Contrails have been made to show the vast disproportion between the quantity of food obtained from any given extent of land in a cultivated crop, and what the same extent of pasture yields. But it should be remembered, that the fertility of a cultivated field is often acquired by its having lain in pasture. The quantity of food from cultivated crops is not always in proportion to the extent of the land cultivated. The county of Ayr, in the west of Scotland, contains, he says, a great deal of good soil. It is not much more than forty years since he remembers the inhabitants of that county palling in crowds with hares, pack-faddles, and empty bags, to the East, to bring pease and barley, of which they made a kind of bread to serve them in summer. At that time the farmers were under no restraint as to the proportion of their farms, which they might have in tillage. Soon after, a gentleman who had the management of a great estate in that county, made a regulation in the leaves, by which the farmers were bound to have never more than a third of their farms in tillage. Other proprietors adopting the same regulations, it became general: and the farmers were afterwards restricted to plough no more than one fourth. Of late, this country, though not less populous than formerly, sends always a great deal of grain to the neighbouring districts; and instead of empty bags and pack-faddles, sends carriages loaded with cheece to Leith, to be shipped for London. Thus by laying land which has been in tillage, frequently in pasture, the future fertility of the country is enhanced, and its present produce is not diminished.

But it has been stated, he remarks, from high authority, that there is nothing more difficult than to bring old tillage lands to produce good pasture. A person who has been in the habit of attending to the culture of the fields, will have some difficulty in comprehending this position. He will have observed, that when the seeds of any of the grasses are permitted to vegetate on land which has been long under tillage culture, they grow with remarkable luxuriance, if they be not overwhelmed by the growth of weeds in their infancy. If his experience has been of a long standing, he will remember the introduction of clover and rye-grass into this country, and will recollect that the first time these seeds were sown on old tillage lands, the crops of grasses were generally more weighty than any that have succeeded on the same ground. Having found such grounds so much disposed to produce grasses, he will be at a loss to conceive why they should not produce good pasture. As grasses feeds vegetation belt on ground which is of a pretty solid condition, they will sometimes fail, when the texture is too loose, unless that fault has been remedied by early ploughing, or by sufficient rolling, or both. But the belt native grassina (grasses), having an of a great bulk, extending horizontally, are not easily ejected, after they have gained strength, and become unfruitful. In the impulses which have given rise to the above position, the ground must not, he thinks, have been stocked with those perennial plants proper to compose a good pasture. In a long course of tillage, the seeds and roots of the native grasses are worn out and banished: the plants introduced from artificial hay frequently fail in a few years; and the ground is left naked, or stocked only with such coarse weeds as have kept footing in the ground, or had their seeds carried there by winds and birds. But to make tillage grounds bear lasting pasture, they should be stocked with the seeds of such indigenous perennial plants as are known to be adapted to that purpose.

The chief of which are, he says, anthus sobolius, lomum perenne, and alopecurus pratensis, for spring pasture, to be followed by cyphurus crypatus, poa trivialis, &c. The leguminous plants for fall pasture, he adds, are of the genus trifolium, the pratensis, the repens, the lupinum, and the prolum; of the genus ximia, the ericaa and fesum, the laffthys pratensis, &c. If lands which have been long in tillage are stocked with the seeds of the herb, and care taken not to suffer the young plants to be overwhelmed by rank weeds before they get themselves established in the ground, all difficulties will be overcome, and such grounds will be found to yield the most substantial and unfailing pasture.

As all vegetables are composed of the same elements, and nourished by the same kind of juices, it may appear somewhat unphilosophical, in a speculative view, to maintain that the fertility of the soil is preserved by cultivating one species of plants upon it one year, or series of years, and plants of a different species and quality the following.

But it is a generally received aphorism, he observes, that nature delights in variety; and this aphorism is supported by experience in this as well as in other respects. Some kinds of vegetables extend their roots near the surface, others penetrate deeper into the soil, some by overshadowing the earth with their broad leaves render it fruitful and mellow; others, whose naked stalks admit the free circulation of the air, consolidate the soil; some derive the greatest part of their nourishment from the juices lodged in the earth; others draw a considerable proportion from the atmosphere; some, having a longer period of existence, continue long to demand nourishment; others arrive more quickly at maturity, and must be easier supported. Besides, among the various tribes of insecta so feeble in themselves, but to formidable and destructive by their numbers, each has some vegetables which it prefers to others for its food, and refrains to the places where such food is produced; and as they propagate their kind, where their food is found, they must become more numerous, and consequently more destructive, where the cultivation of the same plant is often repeated. There are weeds too, he fears, which bear in this respect some analogy to those insects, and as they cannot be at all times fully eradicated, propagate the more, the oftener they meet with the crop most agreeable to them. By the effects which the growth of different vegetables produce on the soil, the proper medium of confidence is in some measure preserved, the vegetable food better harnessed, and the injuries from noxious insects and weeds somewhat eluded. On all these accounts, the maxim of modern agriculturists, that crops of a different nature and quality should succeed one another, is justified.

But the arguments in favour of alternations of tillage and pasture, are, he remarks, still more urgent. The derangement of that happy medium between extremes of too great friability and compactness, which has endeavoured to shew is essential to the general purposes of vegetation, is the unavoidable consequence of long repeated tillage.

This is always, he contends, in some degree restored, when land is left to rest. If it has been properly treated when in tillage, and well stocked with perennial herbage, when left to rest, it will quickly assume a close cover over its surface, which, from whatever principle it proceeds, experience has always shewn, has a powerful influence in dispersing the foil to fertility. In this state, the waiting to which til-
arget lands are exposed in times of rain; is, he supposes, completely suspended, and the water flows away limpid. While the ground continues covered with a close turf, the root-leaves of the herbage spreading over the surface, absorb and digest the carboic acid of the atmosphere, and, perhaps, also, earthy particles which probably float continually in the air, as before stated. As those leaves are imberced and decay, they are perpetually increasing the bulk of carbon and vegetable mould. The celebrated Mr. Kirwan, indeed, he says, of a different opinion. He supposes, that ground lying in pasture is annually diminishing in fertility, though in a less degree than that from which a vegetable crop is carried off, because a part is restored in the excrements of pasturing animals. But though poor soils which are incapable of producing a close turf over their surface, gain little by lying at rest, it is evident, that every foil, which either from its natural conformation, or from the improvements made on it by proper culture, has attained a close cover of sweet herbage, is perpetually gaining. Whenever the temperature is mild, a continual reproduction is taking place; and all the horizontal foliage, which escapes the mouths of pasturing animals, falls into decay and accumulates on the surface. On breaking up such old pastures a surfaced stratum may be observed, differing in colour and conformation from that which lies under it, the thickness of which is in proportion to the time the ground has lain at rest. What is here stated, is, he thinks, corroborated by the following experiment. Having sometimes observed a kind of turf formed over the hardest stones in certain situations, he collected some of which had grown to more than an inch thick on some flat foles, lying at a damp place, at the foot of a northerly declivity under some trees. It seemed to have commenced with the growth of some of the smaller muflci and algae. On this ground the fucula onha and pea glanca had taken root, and formed a strong turf. After it was dried, he subjected a pound of it to combustion on an iron shovell over a fire till it was reduced to black dust. The residue weighed half an ounce, whereas the greatest residue he ever obtained from a pound of dried peat burnt, was not more than five drams. If such a quantity of mould could thus be accumulated by the grasses growing on a naked rock, may it not accumulate at least in as great a proportion on the foil where the succession of growth is incomparably greater?

It is true, he observes, that some foils by long lying at rest, conduce so much as to incommode the roots of the grasses, and on others the moles prevailed so much as to overcome the effulent herbage, but the fertility of the foil is not thereby diminished. Its present energy is only suspended, while it is acquiring additional vigour for future exertions. When such land is again employed in tillage, the spoils of the turf, together with a great part of what has been consumed by pasturing animals refored in excrements, are turned down and mixed with the foil, by which its conformation is improved, and its thickness and principle of fertility augmented. Hence the tillage crops are plentiful—the cars large and plump—and the produce of one year equal to two or more on land weared out by perpetual turning.

"It must not be overlooked, by what is here or formerly said, that he means to undervalue the operation of the plough. But, as we are studying in what manner the fertility of the country may be preferred and improved, and the greatest quantity of disposable produce obtained at the least possible expense, it is necessary to examine how all these aids which nature offers may be made to co-operate with the artificial means of agricultural improvement, and not blindly expect from mechanical labour, more than it can possibly produce. When barren foils are to be brought from a wild state, it is by mechanical labours only that their obnivousness can be subdued, and the different ingredients properly blended. The turf of old grass ground will frequently require a good deal of mechanical operation to mix it with the earths, and facilitate its putrefaction. But when these, and such other aids as mechanical labour is adapted to accomplish, are obtained, that medium of confidence on which fertility depends will be best preserved by alternate successions of labour and reft. The proportion and order of those successions must no doubt vary greatly according to circumstances. While those where the foil is deep and of the most favourable conformation, and where adventitious manure is attainable, may be much occupied in tillage crops, without fubliming great deterioration; in the more elevated grounds, where the foil is generally less happily conformed, exposed to fewer washings and manure less abundant, a greater proportion of the farm ought always to be in pasture. But in all situations and circumstances, the foil will be benefited by being occasionally at rest, provided care has been taken to lay it down unexhausted, free of weeds, and well flooked with proper grasses. By this system of alternations of tillage and grasses crops, the attention of the husbandman is less dissipated, and his labours more regularly distributed. The live stock fed on his pasture, furnish him with manure to enrich his tillage fields, and the more they are enriched, they are the better fitted to yield an abundant return of grasses, when they come in course to be laid to reft. When ground is brought to yield abundance of sweet grasses it is profitable in pasture, and while it continues so it is still improving in fertility, and becomes more and more adapted to yield plentiful tillage crops. Thus under good management, the fertility of the country may progresively advance, and the disposable quantity of provisions for the use of the consumer, and the net return to the husbandman, perhaps, exceed what the operative and expensive system of perpetual following, and crops without rest, could produce.

"Convertible husbandry is not less superior to perpetual grass. Land which lies perpetually in grass, is deprived of the advantage of having the vegetable substance accumulating on the surface from time to time mixed into the foil. By the working of moles, ants, and other vermin, by the condensation of the foil, by the prevalence of moles and useless weeds, the turf is deformed and the reproduction of sweet pasture diminished. Water is frequently detained on the surface, and chills the growth of excellent herbage, and thus the growth becomes more feeble and slow. In proportion to the decay of excellent herbage, plants which are noxious or unprofitable prevail; the pasture becomes gradually less, and the fertility of the foil is almost useless to the owner and to society, while it remains in that state."

The practice of this husbandry must of course in many instances be highly preferable to the cultivator. See Tillage and Grass.

CONVEX, bending down on every side, as the outside of a globular body.

Convex freezes, leaf, lan, mirror, supertices. See the several subtilitantes.

CONVEXITY, the exterior surface of a convex, i.e. gibbous and globular thing; in opposition to concavity, or the inner surface, when hollow or depressed.

The word is of particular import in catoptrics, and dioptrics; where it is applied to mirrors and lentes; which see. See also Refraction.

CONVEYANCE, in Law, a deed, or instrument, by which lands, &c. are conveyed, or transferred, by the proprietor to some other person. In the diffusion of this subject, it is proper to inquire who may thus alienate and to whom a man may alienate, or the several modes of
of conveyance. With regard to the first inquiry, who is capable of conveying and who of purchasing, the subject of consideration is rather the incapacity, than the capacity, of the several parties; for all persons in possession are prima facie capable both of conveying and purchasing, unless the law hath laid them under any particular dis-
abilities. But if a man has only in him the right of either possession or property, he cannot convey it to any other, left pretended titles might be granted to great men, by which title might be trodden down, and the weak op-
preffed. (Co. Litt. 214.) Yet revocations and vested re-
mainders may be granted, because the possession of the par-
ticular tenant is the possession of him in reversion or re-
mainder; but contingencies, and mere possibilities, though they may be released, or devised by will, or may pass to the heir or executor, cannot be assigned to a stranger, unless cou-
pled with some present interest. (Sheppard's Touchstone, 258, 259, 322. 11 Mod. 152. 1 P. Wms. 574. Str. 132.)

Perfons attainted of treason, felony, and praemunire, are incapable of conveying; from the time of the offence com-
mited, provided attainted follows, for such conveyance by 
them may tend to defeat the king of his forfeiture, or the 
lord of his ecchatch. But they may purchase for the bene-
fit of the crown, or the lord of the fee, though they are dis-
able to hold the lands so purchased, if after attainer, be-
ing subject to immediate forfeiture; if before, to a lease as well as forfeiture, according to the nature of the crime. 
(Co. Litt. 42, 2.) Thus also corporations, religious or 
others, may purchase lands: yet, unless they have a licence 
to hold in mortmain, they cannot retain such purcahse; but 
shall be forfeited to the lord of the fee. Idiots and per-
sons of non-fame memory, infants, and persons under du-
refs, are not totally disabled either to convey or purchase, 
but, ful modo only. For their conveyances and purchases are 
voidable, but not actually void. The king indeed, on 
behalf of an idiot, may avoid his grants or other acts. 
(Co. Litt. 247.) See Idiot. A feme-covert may purchase an 
eflate without the consent of her husband, and the convey-
ance is good during the coverture, till he avoids it by some 
act declaring his dissent. And though he does nothing to 
avoid it, or even if he actually consents, the feme-covert her-
self may, after the death of her husband, waive or disagree 
to the same; may, even her heirs may waive it after her, if 
she dies before her husband, or if in her widowhood the doe 
nothing to express her consent or agreement. (Co. Litt. 3.)

But the conveyance or other contract of a feme-covert (ex-
cept by some matter of record) is absolutely void, and not 
merely voidable (Perkins, § 154, 1 Sid. 1200; and there-
fore cannot be affirmed or made good by any subsequent 
agreement. The sale of an alien boll is also peculiar. — For 
his may purchase any thing; but after purchase he can hold 
nothing, except a lease for years of a house for convenience of 
merchandise, if he be an alien-friend: all other pur-
chases (when found by an inquest of office) being immedi-
ately forfeited to the king (Co. Litt. 2). Papists, and per-
fons professing the popish religion, and neglecting to take 
the oath prescribed by statute 18 Geo. III. c. 60. within 
the time limited for that purpose, are by lat. 11 and 12 
W. III. c. 4. disabled from purchasing any lands, rents, or 
hereditaments; and all estates made to their use, or in trust 
for them, are void. (1 P. Wms. 354.)

In answer to the second inquiry, or how a man may alien 
or convey, we are to ficate the several modes of convey-
ances. A translation, or transfer, of property being ad-
mitted by law, it became necessary that this transfer should 
be properly evidenced, in order to prevent disputes as to the 

fact, or in relation to the persons concerned, or with regard 
to the subject-matter, or with respect to the mode and quan-
tity of the transfer. The legal evidences of this translation 
of property are called the common assurances of the kingdom. 
See Common Assurances.

Deeds (see Deed) which form the property 
of lands and tenements from man to man, are commonly de-
nominated conveyances; and those are either conveyances at 
common law, or such as receive their force and efficacy by 
virtue of the statute of uses. Of conveyances by the com-
mon law, some may be called original or primary conveyances; 
which are those by means of which the benefit or estate is 
created or first arises; and others are derivative or secondary, 
by which the benefit or estate, originally created, is en-
larged, restrained, transferred, or extinguished. Original 
conveyances are the following, viz. Feoffment, Gift, Grant, 
Leaves, Exchange, and Partition; which deed respectively. 
Derivative conveyances are kelode, Confirmation, Surrender, 
Assignment, and Defeasance; which deed under their proper 
titles. For other conveyances, which have their force and 
operation by virtue of the statute of uses, which have been 
derived from it or introduced in consequence of it; see Uses. 
See also Covenant to Stand Seized to Uses, Bargain and 
Sale, Lease and Release, and Revocation of Uses.

A conveyance cannot be fraudulent in part, and good as 
to the rest: for if it be fraudulent and void in part, it is 
void in all; and it cannot be divided. 1 Litt. Abr. 311. 
Fraudulent conveyances to deceive creditors, defraud pur-
chasers, &c. are void, by statutes 15 Eliz. c. 5. 27 Eliz. 
c. 4. See Fraud.

CONVICT, in Common Law, one who is found guilty 
of an offence, by the verdict of a jury. This conviction 
may accrue two ways; either by his confessing the offence 
and pleading guilty; or by his being found so by the verdict 
of his country. Judge Blackstone says, that in the Roman 
republic, when the prisoner was convicted of any capital 
offence by his judges, the form of pronouncing that 
conviction was peculiarly delicate, not that he was guilty, 
but that he had not been sufficiently on his guard, "parum 
cavile videtur."

According to Crompton, a person is also a convict, or 
faii to be convicted, when, after having been outlawed, he 
appears and confesses, or is found guilty by the inquest; 
and he says, moreover, that when a statute excludes from 
clergy persons found guilty of felony, &c. it extends to 
those who are convicted by confession. (Cromp. Int. 9.)

The law implies that there must be a conviction before 
punishment, though it is not so mentioned in a statute; and 
where any statute makes a second offence felony, or subject 
to a heavier punishment than the first, it is always implied 
that such second offence ought to be committed after a con-
viction for the first. (1 Hawk. P. C. c. 10. § 9. c. 41. § 3.) 
Judgment amounts to conviction; though it doth not follow 
that every one who is convicted is adjudged. A conviction 
at the king's suit may be pleaded to a suit by an informer, 
on a penal statute; because while in force it makes the 
party liable to the forfeiture, and no one ought to be pu-
nified twice for the same offence; but conviction may be 
punished to a new suit by the king. (1 Hawk. P. C. c. 10.) 
A person convicted or attainted of one felony may be pro-
fected for another, to bring accessories to punishment, &c. 
(Fitz. Coron. 379.)

Perfons convicted of felony by verdict, &c. are not to be 
admitted to bail, unless there be some special motive for 
granting it; as where a man is not the same person, &c. for 
bail ought to be before trial, when it stands indifferent 
whether
whether the party be guilty or not. (2 Hawk. P. C. c. 15; § 43, 80.) See Bail. Conviction of felony, and other crimes, disabales a man to be a juror, witnesses, &c. Conviction and attainted, &c. are, in our law-books, frequently confounded. On conviction, (or even upon an acquittal when there is no reasonable ground to prosecute, and, in fact, a bona fide prosecution,) for any grand or petit larceny, or other felony, the reasonable expences of prosecution, and also, if the prosecutor be poor, a compensation for his trouble and losses of time, are by statutes 25 Geo. II. c. 35., and 18 Geo. III. c. 19. to be allowed him out of the county fcoot, if he petitions the judge for that purpose; and by statutes 27 Geo. II. c. 3, explained by the same statute 18 Geo. III. c. 102, all persons, appearing upon recognizance or falsus praemunire, to give evidence, whether any indictment be preferred or not, and as well without conviction as with it, are entitled to be paid their charges, with a farther allowance (if poor) for their trouble and losses of time. Moreover, on a conviction of larceny in particular, the prosecutor shall have retribution of his goods, by virtue of the statute 21 Hen. VIII. c. 11. and the construction of this act having been in great measure conformable to the law of appeals, it has therefore in practice superseded the use of appeals of larceny. It is now usual for the court, upon the conviction of a felon, to order (without any writ of retribution) immediate retribution of such goods as are brought into court to be made to the several prosecutors, or else, without such writ, the party may peaceably retake his goods, wherever he happens to find them, unless a new property be fairly acquired in them. Or, if the felon be convicted and pardoned, or be allowed his clergy, the party robbed may bring his action of trover against him for his goods, and recover a satisfaction in damages. But such action does not lie before prosecution; for then felonies would be made up and healed (1 Hal. P. C. 546); and also reparation is unlawful, if it be done with intention to smother or compound the larceny; it then becoming the heinous offence of theft-sbot; which fee.

When a person is convicted of a misdemeanor which principally and more immediately affects some individual, as a battery, imprisonment, or the like, it is not uncommon for the court to permit the defendant to speak with the prosecutor, before any judgment is pronounced; and if the prosecutor declares himself satisfied, to inflict but a trivial punishment. This is done, to reimburse the prosecutor his expenses, and make him some private amends, without the trouble and circuit of a civil action. This, says judge Blackstone, is a dangerous practice, which, though intruded to the discretion of the judges in the superior courts of record, ought never to be allowed in local or inferior jurisdictions, such as the quarter-sessions; where prosecutions for nuisances are by such means too frequently commenced, rather for private lucre than for the great ends of public justice. Above all, he says, it should never be suffered, where the testimony of the prosecutor himself is necessary to convict the defendant; for there the rules of evidence are entirely subverted; the prosecutor becomes in effect a plaintiff, and yet is suffered to bear witness for himself. Nay, even a voluntary forgivenes, by the party injured, ought not, in true policy, to intercept the stroke of justice. "This," says an elegant writer (Beccaria, ch. 45) who pleads with equal strength for the certainty as for the lenity of punishment, "may be an act of good nature and humanity, but it is contrary to the good of the public. For, although a private citizen may dispense with satisfaction for his private injury, he cannot remove the necessity of public example. The right of punishing belongs not to any one individual in particular, but to the society in general, or the sovereign who represents that society; and a man may renounce his own portion of this right, but he cannot give up that of others." Black. Comm. Book iv.

Convict reconvict, he who has been legally presented, indicted, and convicted, for refusing to come to church to hear the common prayer, according to the statutes 35 Eliz. and 3 Jac. I.

This is commonly understood to be a popish reconvict; though any others who refuse coming to church on the same account are as properly denominated reculants.

CONVICTION, in Law. See Convict.

Conviction, in Theology, expresses the full degree of repentance; wherein the sinner becomes sensible of his guilt, of the evil nature of sin, and of the danger of his own ways.

Conviction, summary, in Law, is such as is directed by several acts of parliament, for inflicting certain penalties created by these acts, without the intervention of a jury: the party accused being acquitted or condemned by the suffrage of such person only, as the statute has appointed to be his judge. Of this kind are all trials of offences contrary to the laws of Excise, and other branches of the Revenue, proceedings before Justices of the peace, and the method used by superior courts of justice for punishing contempt by attachment. See Contempt.

Convivium, banquet, in our Ancient Customs, Law-Books, signifies the same thing among the laity as prosecution among the clergy; viz., when the tenant was obliged, in virtue of his tenure, to provide meat and drink for his lord once, or oftener, in the year.

Convivium militare, a military banquet or repast. The repast of Roman soldiers was a particular object of military discipline, which the commanders themselves paid attention to. The soldiers were not suffered to eat alone but by troops, in order to prefer union and good fellowship amongst them.

Conuli, in Natural History, Conuli Kleini, a clas of the Lechinus, in the Mollusca order of Vermes. See Echinus.

Conulus, a genus of the Trochus, in the Tethysea order of Vermes. See Trochus.

Convocation, a general assembly of the representatives of the clergy of a province, summoned by the king's writ to consult of the more weighty affairs of the church, as oft as a parliament is convened to consult of those of the state.

The king's writ is directed to the archbishop of each province, requiring him to summon all bishops, dean, archdeacon, cathedral and collegiate churches, &c.

Upon which, the archbishop directs his mandate to his dean provincial, first citing him peremptorily; then willing him, in like manner, to cite all the bishops, dean, &c. and all the clergy of his province; but directing, withal, that one proc- tor lent for each cathedral and collegiate church, and two for the body of the inferior clergy of each diocese, may suf- fice: which the dean accordingly does.

The place where the convocation of the province of Canterbury has been usually held, is St. Paul's church; whence they have been prorogued to St. Peter's in Westminster, in the chapel of Henry VII. or the Jerusalem Chamber, where there is an upper and lower house.

The upper house, in the province of Canterbury, consists of twenty-two bishops, whereof the archbishop is always presi- dent, who prorogues and dissolves the convocation by mandate from the king: and before the reformation abbots, priors, and other mitred prelates sat with the bishops. All,
at the opening of a convocation, are in their scarlet robes and bands.

The lower house consists of twenty-two dean, fifty-four archdeacons, twenty-four proctors for the chapters, and forty-four proctors, representing the parochial clergy; in all 144.

Each house hath a prolocutor chosen among themselves; and that of the lower house is presented to the bishops. Things are first usually proposed in the upper house; then communicated to the lower. All the members of both houses have the same privileges in freedom from arrest, as the members of parliament have, flat 8 Hen. VI. c. 1. and the proctors of the clergy received wages from their constituents.

The convocation exercises jurisdiction in making canons with the king's assent, (flat. 25 Hen. VIII. c. 19.) This statute which restrains the convocation from making or executing any canons repugnant to the king's prerogative, or the laws, custom, and statutes of the realm, was merely declaratory of the old common law. (12 Rep. 72.) It part of it only being new, which makes the king's royal assent actually necessary to the validity of every canon. To the convocation also belong the examination and censure of liturgical and scholastic books and persons. But appeal lies from their proceedings to the king in council, or to his delegates. In case the king himself be a party, the appeal lies by flat. 24 Hen. VIII. c. 12. to all the bishops assembled in the upper house of convocation. See Court of delegates.

The archbishop of York, at the same time, holds a convocation of the clergy of his province. After the like manner at York; and, by constant correspondence, debates and concludes of the same matters as are debated by that of Canterbury; but they are distinct and independent of each other; and when they used to tax the clergy, they granted different subsidies. In the province of York, the convocation consists only of one house; and on account of the small number of dioceses in this province, each archdeacon elects two proctors.

It has been customary with the convocation, for many years back, regularly to assemble, and to adjourn without proceeding to any business, so that the convocation now exists more in form than for any effective purpose. See Church of England.

In the year 1711, the convocation was assembled with the new parliament; the lower house chose Atterbury for its prolocutor; and both houses concurred in conferring some tenets that favoured Arminism, broached and supported by Mr. Whitton, mathematical professor in Cambridge. The archbishop doubted whether this assembly could proceed against a man for hereby; the judges were consulted, and the majority gave their opinion that the convocation had jurisdiction. Five of them professed the contrary sentiment, which they maintained from the statutes made at the reformation; the queen, not doubting their jurisdiction, expected them to proceed, but their scruples arising, they determined to examine the book, without proceeding against the author, and this was censured accordingly. An extract of the sentence was sent to the queen, but she did not signify her pleasure on this subject, and the affair remained in suspense. Before the queen's death, in 1714, the lower house of convocation had declared, that a book published by Dr. Samuel Clarke, under the title of "The Scripture Doctrine of the Trinity," contained affections contrary to the Catholic faith. They sent up extracts from this performance to the bishops; and the doctor wrote an answer to their objections. He was prevailed upon to write an apology, which he presented to the upper house; but apprehending that it might be published separately, and misunderstood, he afterwards delivered an explanation to the bishop of London. This was satisfactory to the bishops; but the lower house resolved, that it was no recantation of his heretical assertions. (See the article Clarke.) In the year 1717, the proceedings in the convocation turned chiefly upon two performances of Dr. Hoadly, bishop of Bangor. One was entitled "A Prefervative against the principles and practices of the Non-Jurors," the other was a sermon preached before the king, under the title of "The nature of the kingdom of Christ?" the convocation appointed a committee to examine the bishop's two performances; and thus commenced the famous controversy, called "Bangorian," in consequence of a letter written on the subject of the bishop's discourse by Dr. Snape, master of Eton college. The convocation drew up a representation, in which the preservative and the sermon were censured, as tending to subvert all government and discipline in the church of Christ; to reduce his kingdom to a flate of anarchy and confusion; to impugn and impeach the royal supremacy in caufes ecclesiastical, and the authority of the legislature to enforce obedience in matters of religion by civil sanctions. Before this representation could be brought into the upper house, that whole assembly was proscribed by a special order from the king. This measure, however, increased the controversy. A great number of pens were drawn against the bishop; but his chief antagonists were Dr. Snape, and Dr. Sherbick, whom the king removed from the office of his chaplains. The convocation has not been permitted by government to do any business of consequence since this time, but merely to confine itself to matters of form. See Church of England.

The English clergy, anciently, had their representatives in the lower house of parliament; as appears by the record, much prized by lord Coke. Among the freetholders who were present in parliament, we find many of the inferior, secular, clergy; an order of men who were, certainly, too great elimation and account in the state not to have had a share in the legislature, either personally or by representatives. There are not, indeed, any words of fummons now remaining, which require proctors to be sent for them to the parliament of this kingdom, before the 23rd year of Edward I; but from the annal of Burton (p. 355, f.amba. 1255) it appears, that the whole body of the clergy were so represented in the 30th of Henry III. Nor is this remarked as a novelty by any of the historians who wrote in that age; though, being all ecclesiastics, they would probably have thought it more worthy of observation than any event in which the laity alone were concerned. It may be therefore presumed, that, not only the attendance of the inferior clergy in parliament, which is evidently proved by many passages in more ancient historians, but this kind of representation of them had been customary long before. See Borough. In later times, from a desire of independence on the state, to which they were invited more and more by the pope, they gradually withdrew themselves from any attendance in parliament, either personally, or by representatives; so that, after the reign of Henry VI, they are hardly ever mentioned as present there; although in the 1st year of Richard II. the commons had drawn in a petition to the king, "how that before those times many judgments and ordinances, made in the times of the progenitors of our lord the king in parliament, had been repealed and disannulled, because the state of the clergy were not present in parliament at the making of the said judgments and ordinances." After the reformation of religion, in the reign of Edward VI., an attempt was made in convocation to have the lower house united to the house of commons, "according to ancient custom, sed ab antiquo, societate confuerat." It was also proposed to queen Elizabeth, but rejected. The clergy continued to tax themselves in a separate body, till the restoration of Charles II; then after which
CON which they were taxed in the same manner and conjointly with the rest of the commons; and have ever since been represented in parliament by the same persons, which has more embodied them with the laity, and prevents the setting up of a church interefl fufficient from that of the people. It is remarkable, that this very important alteration in the state of the kingdom was made without any law, by agreement with the clergy. (Littleton's Hist. Hen. II. vol. iii.)

In the parliament of Ireland, originally formed on the model of that of England, the clergy continued to be members of the house of commons, till they were excluded by an act of parliament, 28 Hen. VIII. A. D. 1536, because they supported the authority of the pope, and obstructed the reformation of the church. Whilst the clergy continued to grant their own money in their convocations, their grants were not effectual till they were confirmed in parliament. In the 15th century the clergy of England had great influence in all the public councils of the kingdom, and particularly in parliament: they continually resided in the kingdom, and were present in these councils; while the nobles and great men were engaged in warlike expeditions into France or Scotland. Besides all the archbishops and bishops, twenty-five abbots and two priors were summoned to every parliament, and sometimes more; so that the spiritual lords were generally double the number of the temporal lords in the house of peers (Prynce's regifter of writs, vol. i. & iv.) This enabled the prelates to procure singulary laws against heretics, and to secure the immense possessions of the church, together with all her abulf errors and wretched superstitions, from all attacks.

1 Hen. IV. c. 15. 2 Hen. V. c. 7.

CONVOLULUS, in Botany, the tenth natural order of dicotyledonous hypogynous plants, in the family of Jullieu, with the following genera: Calyx five-cleft, most frequently permanent. Corolla regular, commonly with a five-cleft border. Stamens generally five, inserted at the base of the corolla, and alternating with its segments. Style one, or definitely divided; when one, with a stigma either simple or divided; when more than one, with as many simple stigmas as there are divisions. Fruit capsular, often three-celled, more rarely two or four-celled; cells with one or more seeds. Seeds marked with an umbilical eye at the base, somewhat obovate, and affixed below to the central partition; valves free, with their edges adjoining to the angles of the partition; radicle of the arched corollum interior. (Coreolum fluit up by the periferms?) Stems thorny, or more frequently herbaceous; many twining; many effescent. Leaves alternate, very rarely almost opposite, (always simple, Vent.)

This order is nearly allied to the Borraginace and Polemonia, in its regular five-cleft pentandrous corolla, and alternate leaves; but differs from the latter, in having the partition adjoining to the edges, not to the middle of the valves; and from the former, in the fruit not being gynopeltic. Jullieu alludes to it the following genera:


Ventenat has changed the name of the order to convolvulaceae, and has included in it only convolvulus, ipomeza, evolvulus, and ciffampelos; entirely omitting marupa, mouroucoa, retzria, endrachium, nana, hydrolea, and sagonca; and removing cufcuta to his undetermined plants, and dispensia and lceflia to the polemonia, his polemonaceae. La March's natural family of lferons corresponds exactly with the first two sections of Jullieu.


Gen. Ch. Cal. perianth five-cleft. Cor. monopetalous, bell-shaped or funnel-shaped, plaited; border generally spreading, more or less five-lobed. Stam. filaments five, awl-shaped, shorter than the corolla, approximating at the base. Pet. germ superior, rondund; style filiform; stigma simple or bifid. Perir. capsule surrounded by the calyx, rondund; one, two, three, or four-celled; one, two, three, four, or many-valved. Seeds one or two in each cell.

Eff. Ch. Five-cleft. Corolla bell or funnel-shaped. Stigmas one or two. Pericarp a capsule, or dry berry. Seeds one or two in each cell.

Obx. Authors often call the calyx five-leaved, when it is very deeply five-cleft.

* Stems twining.

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Britain, and most parts of Europe, climbing up hedges in moist ground. Its infested juice, taken in doses of twenty or thirty grains, is a powerful purgative. 4. C. Wheeleri. Mart. 84. Wild. 5. Vahl. Symb. 2. 366. (C. flagitaria folius, Wheelerl; Piek. Phyt. tab. 85; fig. 5; Ipomea flagitata; Poir. It. 2. 160. tab. 3.) "Leaves arrow-shaped, rounded behind, entire; peduncles cylindric, one-flowered." Wholly smooth. Leaves acute; petiole the length of the leaf. Peduncles shorter than the petiole, thicker, bracteate towards the middle, thicker under the flower. Allied to C. sepium. A native of Spain and Barbary. 5. C. comumia. Link. Mart. 3. Defr. 81. Lam. 1879. Wood. Med. Bot. London, 1, 2. 1876. Symb. tab. 1, fig. 5. Morif. Hist. 2. 12. tab. 3. fig. 5. Banh. Fl. 294.) "Leaves triangular-arrow-shaped; peduncles cylindrical, nearly double the length of the leaves, about three-flowered." Root perennial, long, thick, flabby, full of a milky juice. Stems cylindrical, slender, somewhat villous. Leaves alternate smooth, acute; posterior lobes diverging, with a tooth on the inner side of each. Flowers large, purplish white or pale yellow; peduncles solitary; segments of the calyx emarginate; bracts small, awl-shaped, spreading, remote from the flower. Cephal three or four-celled. A native of Syria and Asia Minor. For its medical uses, see SCAMoMY. 6. C. involucratus. Wild. 5. "Leaves cordate-hastate, pubescent; peduncles about three-flowered; calyces bracteate." Stem cylindrical, pubescent-villos. Leaves oblong, obtuse, mucronate, quite entire, pubescent on both sides; truncate at the base, undivided, rather obtuse; petioles villous. Peduncles about the length of the leaves, pubescent. Bracts two at the division of the peduncle, pubescent, oblong, acute; two others at the base of each flower, villous, pubescent, elliptical, rather acute, longer than the calyx, and involving it. A native of Guinea. 7. C. flagitifolia. Smith Prof. Fl. Gr. p. 133. Flor. Cez. tab. 193. "Leaves cordate-hastate, covered with long distinct hairs, angular at the base; peduncles generally one-flowered; capsules hispate." A native of the islands in the Archipelago, in vineyards and cultivated ground. 8. C. fibriceps. Linn. Mantis. 203. Mart. 4. Defr. 80. Lam. 1878. Wild. 6. (C. rupestris; Pallas It. 3. n. 80. tab. R.) "Leaves cordate-acuminate, even-surfaced; peduncles two-flowered; filipes retruse, decurrent." Root annual. Stems from four to six feet long, slender, slightly winged from the decurrence of the filipes, but not two-edged. Leaves ending in a point, which extends to half their whole length, soft, thin, smooth, veined, entire, paler underneath; filipes vertical, small, obtuse. Flowers small, scarcely twice the length of the calyx, whitish or flesh-coloured, fugacious; bracts often wanting; when present, bristle-shaped, sometimes at the division of the peduncle, sometimes on the pedicles; calyx smooth, deeply divided; ligule capitule-doubled. A native of Siberia, flowering in July and Aug. Introducet into England in 1779. 9. C. rupestris. Wild. 7. "Leaves obtusely heart-shaped, oblong, lanceolate, acute; peduncles one-flowered." Stem smooth, but little twining, somewhat shrubby. Leaves two inches long, smooth, slightly hairy underneath, and at the edges, when viewed through a lens. Flowers violet; peduncles almost the length of the leaves; bracts two, awl-shaped, about the middle of the peduncle; calyx-leaves, egg-shaped, acute, a little hairy, corolla flat, five-lobed; plucks a little hairy on the outside. Supposed to be a native of Siberia. 10. C. farinosus. Linn. Mant. 293. Mart. 5. Defr. 79. Lam. 1877. Wild. 8. Jacq. Hort. Vind. 1. 13. tab. 35. Salisb. Par. Lond. 35. "Leaves heart-shaped, acuminate, repand; peduncles three-flowered; stem mea-
ered; shorter than the petiole. "Root perennial. The young branches, petioles, leaves, peduncles, and calyxes, cloathed with a silken fliming down. "Stems indrical, woody, almost smooth. "Leaves broad oval, alternate, acute, entire, nerved, about twice the length of the petioles. "Peduncles axillary, foliary, with two awl shaped bractes about the middle; calyx short; two inner leaves smaller; corollas at least two inches long, funnel-shaped. A native of the Philippine islands. Specimen in the herbarium of Jussieu. 16. C. che- 

nedent at the tip, dilated and toothed at the base; calyx-leaves elliptical, cup-shaped; "Root annual. "Stems bilform, smooth, slightly fleshy, almost fimple. "Leaves alternate, about half an inch long, smooth; petioles about a line long. "Flowers purplish at the base, with a yellowish white border; peduncles axillary, foliary, one-flowered, longer than the leaves, with two small bractes near their summit. A native of the East Indies. Introduced into England in 1775, by Sir Joseph Banks. 20. C. angustifolius. Mart. 89. Defr. 32. Lam. 2030. Willd. 15. (Ipomoea angustifolius; Jacq. ic. 2. tab. 37.) "Leaves linear, halate, obtuse, mucronate, smooth; auricles generally entire; peduncle one-flowered." "Root spindle-shaped, rising about an inch above the surface of the ground, with the appearance of a fnder, simple, erect, leaflets firm. "Stems several, febrly a foot high, a little twining, almost fiple, filiform, weak. "Leaves an inch long, about a line broad, numerous, on very short petioles. "Flowers yellow, longer than the calyx; peduncles axillary, foliary, shorter than the leaves, with two awl-shaped bractes, above the middle, upper half thicker; calyx-leaves connivent, lancet; corolla funnel-shaped; border very open; divisions egg-shaped, obtuse; figma globular, didymous. "Root annual. A native of Guinea and the East Indies. 21. C. arigloleobifoli- lius. Mill. Houltou MSS. "Leaves halate-lanceolate; auricles rounded; peduncles many-flowered." "Root annual. 

stem ten feet high, slender. "Flowers yellow, in small clusters, on long peduncles. "Cajpiles trigonous, three-celled. "Seeds two in each cell. Seeds sent to Mr. Miller from Carthage in New Spain. 22. C. adonifolius. Defr. 82. Lam. 2005. "Leaves halate, linear; petiules in pairs, somewhat filiform; calyx mucrinated." "Stems herbaceous, weak, a little villous. "Leaves alternate, dilant, petioted, entire, smooth, from three to four inches long; petiules about an inch long. "Flowers near two inches long, axillary; peduncles nearly the length of the petiules, smooth, with two small bractes about the middle; calyx-leaves egg-shaped, rough, with sharp tuberces. A native of Senegal. 23. C. japonicus. Mart. 7. Defr. 6. Lam. 2005. Willd. 16. Thomb. jap. 87. (Kosud Kudli vulgo Piraga wo; Kempf. Amen. 589.) "Leaves halate, lancolate, acute; later lobes one-toothed; peduncles one-flowered; stem simple. "Stems filiform, smooth. "Leaves alternate, almost unilateral, petioted, smooth; middle lobe an inch long, lancolate, entire, acute; side ones a little reflexed, shorter. "Flowers axillary, foliary; peduncles nearly as long as the leaves, filiform, smooth; in the calyx egg-shaped, acute, entire, smooth. A native of Japan. 24. C. eretricus. Defr. 7. Lam. 2006. "Leaves cordate-arrow-shaped, obtuse behind; peduncles shorter than the petiole, without bractes. Whole plant, except the corolla, cloathed with short white hairs. "Stems scarcely a foot and a half long, slender. "Leaves alternate, acute. "Flowers white, small; pediules one or two-flowered; segments of the calyx five, two outer ones broader; figmas two, globular, purplish. Native country unknown. Cultivated in the botanic garden at Paris. 25. C. leucanthus. Defr. 8. Lam. 2007. (Ipomea leucantha; Jacq. Coll. 2. 280. ic. 2.) "Leaves heart-shaped, acuminate; peduncles shorter than the petiole. "Root annual. "Stems about four feet high, slender, cylindrical, branched, redish, and somewhat rough towards the bottom. "Leaves alternate, entire, or slightly scolloped, smooth. "Flowers white; peduncles axillary, foliary, an inch long, erect, cylindrical, smooth, one-flowered: calyx leaves mucronate, a little open at the summit, ciliated at the base; corolla funnel-shaped; anthers purplish; figmas two-lipped. A native of America. 26. C. fruticosus. Defr. 9. Lam. 2008. "Shrubby; leaves somewhat heart-shaped at the base, linear lanceolate, petiules short; flowering branches, thick fct with leaves." Root perennial. "Stems three or four feet high, cylindrical, slender. "Leaves not more than two lines broad, sloped at the base, on very short petiules. "Flowers with five purple rays; peduncles larger than the petiules, scarcely the length of the flowers; bractes two, small, awl-shaped, unequal, situated nearer to the flment than to the calyx; calyx smooth; corolla slightly five-lipped. A native of the Canary islands, flowering in April and May. 27. C. dentatus. Mart. 90. Willd. 17. Vahl. Sym. 3. 25. "Leaves halate, smooth; auricles toothed; peduncles many-flowered, mucrinated." "Stems cylindrical, smooth. "Leaves scarcely an inch long, somewhat heart-shaped at the base; middle lobe lanceolate, quite fide; side ones roundish, unequally four or five-toothed; petiules filiform, somewhat mucrinated towards the base. General peduncles spreading, thicker, and a little longer than the pediules; partial peduncles in threes; that in the middle one-flowered; side ones with two or three pedicelled flowers; both mucrinated; rigid; calyx-leaves oblong, obtuse, mucronate, equal. A native of the East Indies, found by Schumacher. 28. C. haf- 


ricles.
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Peduncles shorter than the petiole, villous; calyx-leaves hairy, acuminate, patulous at the tip. A native of Egypt and Arabia. 29. C. Sonneratii. (C. haitatus; Depr. 11. Lam. 2010. Tala-neli; Rheed. Mal. 11. 113. tab. 55.) "Leaves linear, haitatus-acuminate; an-

icles toothed; calyx-leaves simple." Whole plant smooth. Stems very slender, slightly angular. Leaves about two lines broad, alternate, nearly sessile. Peduncles longer than the flower, slender, one or two-flowered, often bent at the in-

ition of the bracteae, thicker upwards; bracteae two, fissional, situated a little above the middle of the ped-

uncle. Flowers yellowish-white, twice the length of the calyx; calyx leaves egg-shaped, acut. A native of the East Indies, communicated to La March by Sonnerat. 30. C. ofarifolius. Depr. 89. Lam. 2287. "Leaves kidney-shaped, broad, veined; peduncles one or two-flowered." Stems cy-

lindrical, smooth, not much branched. Leaves alternate, large, entire, smooth, firm; petioles about two inches long, channeled. Peduncles longer than the petioles; bracteae from two to four, small, awl-shaped, situated almost close to the flowers; calyx-leaves short, egg-shaped, obtuse, two outer ones smaller; corollas at least two inches long; tubular; tube about half an inch in diameter; border but little open, with five pointed divisions; stigma capitate, didymous. A native of Senegal. 31. C. tilesifolius. "Shrubby; leaves heart-

shaped, rounded; younger ones somewhat tomentous; flower and fruit very large." Stems cylindrical, almost smooth. Leaves alternate, a little orbicular, entire; petioles about half the length of the leaves, channeled. Flowers large; peduncles not more than eight or ten lines long, axillary, li-

tary, one flowered; calyx-leaves short, obtuse; almost round; corollas at least three inches long, almost cylindrical; tube narrow as far as the length of the calyx, afterwards eight or ten lines in diameter; stigma capitate, two lobed. Capsule about the size of a walnut, apparently two-celled. A na-

tive of the Isle of France, and the Cape of Good Hope. Found by Commerson. 32. C. panduratus. Linn. Sp. Pl. 5. Mart. S. Depr. 91. Lam. 2080. Willd. 19. (C. megabririzos; Dill. Exth. 101. tab. 85. 65. 99.) "Leaves, some heart-shaped, entire, others panduriform or three-lobed; peduncles longer than the petiole, about two flowered." Root perennial, thick, spine-like haped. Stems long, flender. Leaves distant, petioled. Flowers large, white, with the bottom of fine purple; peduncles axillary, solitary, from one to three flowered; calyx-leaves short; two outer ones shorter and narrower. Capsule two-celled. Seeds hirsute, one in each cell. A native of Carolina and Virginia, flowering from June to September. 33. C. betonisfolius. Mart. 72. "Leaves cordate-arrow-shaped, acute; peduncles one-

flowered." Stem five or six feet high, flender. Flowers white, with purple bottoms; peduncles long, flender. A native of Africa, cultivated by Miller in 1750. 34. C. bre-

tratus. Mart. 91. Vahl. Sym. 3. 25. "Leaves heart-shaped, almost entire, and three-lobed, hispid, attenuated; peduncles one-flowered; outer calyx-leaves bracteate." Stem thinly beft with short hairs. Leaves two inches long; pet-

ioles shorter than the leaf, pubescent. Peduncles the length of the leaf, foliary; bracteae two, lanceolate, acute, situated a little below the calyx; calyx pubescent; inner calyx-leaves oblong, blunt, her, nerves; outer ones much broader, enclosing the others as between two bracteae; corolla villous on the outside, tender, silky; border five-cleft; stigma capitate, two lobed, found in the E. Indies by Koenig. 35. C. bicolor. Mart. 52. Wild. 21. Vahl. Sym. 3. 25. "Leaves heart-shaped, villous, somewhat angular lobed at the base; peduncles one-flowered; outer leaves of the calyx reflexing 

broad. Stem villos. Leaves acute, mucronate, not att-

uated, nearly equal in length and breadth; one, two, or

three-lobed at the bottom, villous on both sides; ven-

ty villous, hoary, and obscurely veined underneath; the younger ones silky. Flowers white, with a violet purple base; brac-

teae, calyx, and corolla, as in the preceding species. Found in the East Indies by Schumacher. 36. C. Geoffroyana. (C. bicolor; Depr. 62. Lam. 2094.) Hairly, leaves somewhat heart-shaped, three-lobed, hoary underneath; peduncles many-flowered." On a superficial view having the appearance of a bramble. Stems flender, cylindrical; beft, as well as the petioles, peduncles, and calyxes, with blackish points, and hispid with rather long flufh hairs. Leaves alter-

tane, longer than their petioles, clothed with fine re-
cumbent hairs, green on the upper surface, hoary under-

neath; lobes oval, acute, entire. Flowers small; peduncles axillary, solitary; thicker and longer than the petioles, dis-

chotomous; bracteae two, linear, awl-shaped, situated at each division of the peduncles; calyx leaves narrow, acute, rather long. Brought from Senegal by M. Geoffrey. 37. C. tri-

lobus. Willd. 22. Thumb. prod. 25. "Leaves heart-shaped, villous, three-lobed; lobes egg-shaped, acute; peduncles one-flowered." A native of the Cape of Good Hope. 38. C. fabquinjulobus. (C. trilobus; Depr. 64. Lam. 2593. Ipomoea triloba; Liin.) "Lower leaves heart-shaped, three-

lobed; upper ones somewhat five-lobed; peduncles three-

flowered." Root annual. Stems two or three feet long, flen-

der, slightly angular, smooth. Leaves alternate, generally shorter than their petioles; middle lobes of the lower leaves egg-shaped, obtuse, mucronate, smooth; lateral lobes of the upper leaves with a deep sinus, which makes them appear five-

lobed. Flowers purple or violet; peduncles angular, nearly the length of the petioles; pedicels very short, bracteae small, egg-shaped; calyx-leaves half the length of the corolla, smooth, egg-shaped, acut, cunivent; corollas small, cylindrical; bor-

der with five sharp teeth. A native of South America, cul-


.s. 167. fig. 7. Feuil. peruv. 3. 16. tab. 11. "Leaves heart-shaped, three-lobed; lateral lobes toothed-angular; peduncles, somewhat three-flowered; calyxes almost as long as the peduncles, smooth." Whole plant quite smooth, except the petioles. Stem cylindrical. Leaves two inches long or more, glaucous, green underneath, with purplish veins; lobes lanceolate; middle one longer, broader, quite entire, acuminate; lateral ones narrower, attenuated, with a smaller broader lobe at the bottom on each side, rounded 

behind, and furnished with an angular tooth; petioles shorter than the leaf, befit with a few scattered hairs. Peduncles rather than the leaf, thickened at the top; lower ones three-flowered; middle ones two-flowered, uppermost one-flowered; calyx-leaves oblong, somewhat membranous, ending in a bristle; stigma capitate. It differs altogether from C. batatas in the smoothness of the stem, and the form of the leaves. A native of America. 40. C. acuminitus. Mart. 94. Willd. 24. Vahl. Sym. 3. 26. "Leaves heart-shaped and three lobed, attenuated; peduncles elongated, many-flowered; calyxes smooth." Stem with a few minute scattered hairs, prilled close, and visible only with a magnifier. Leaves four inches long, three or more broad at the bafe, three-lobed or entire, quite smooth, befted, acute; lateral lobes lanceolate; middle one egg-shaped, attenuated; petals longer than the leaf. Flower large, bell-shaped, purple with a pale bafe and five pale rays running to the margin; peduncles axillary, the length of the petioles alternate; pedicels about five, an inch and half long; bracteae at the bafe of each pedicle two, lanceolate, attenuated, finely 

nered,
nerved, smooth; calyx-leaves lanceolate, attenuated, tender, finely nerv'd, quite smooth; two inner ones a little shorter,��ga capitata. A native of the island of Santa Cruz in the West Indies. 41. C. carolinus. Linn. Sp. Pl. 6. Mart. 9. Defr. 92. Lam. 2088. Willd. 25. Dil. clth. 100. tab. 84. fig. 98. "Leaves heart-shaped, entire, and three-lobed, villous; calyxes even-surfaced; capsules his- tate; peduncles one or two-flowered." Root perennial. Stems slender, reddish towards the root, hairy at the joints. Leaves alternate, scarcely two inches long, some entire, others like those of ivy; petals about the length of the leaves, slender, channelled. Flowers pale purple, resembling those of C. arvensis; peduncles the length of the pedioles, thicker, axillary, solitary, angular, with a few narrow bract. calyx-leaves egg-shaped, acute, fiercely half the length of the corolla, a little ciliate at the edges with whitish hairs. Capsules round, hairy towards the fimnity, two-celled, three-valved. Seeds two in each cell, black, smooth. A native of Carolina. 42. C. hederaceus. Linn. Sp. Pl. 7. Mart. 10. Defr. 12. Lam. 172. Dil. clth. 99. tab. 83. fig. 96. Gart. tab. 134. fig. 2. "Leaves heart-shaped, entire and three-lobed; corollas undivided; fruit erect." Linn. "Peduncles about three flowers; calyxes stubercled." Lam. Root annual. Stems farinose, cylindrical, dull red, two or three feet high. Leaves alternate, petioled, clasped with fine short hairs. Flowers fine blue, with a pale base; peduncles nearly the length of the petioles, axillary, solitary, hairy; bracteae small; pedicels very short; calyx-leaves rough with numerous long hairs, and small black tubercles; two of them narrower. Capsules spherical, smooth, thin, three-celled, three-valved. Seeds two in each cell, black, smooth. A native of Asia, Africa, and America. 43. C. Dilat. Defr. 22. Lam. 2021. Dil. clth. 97. tab. 81. fig. 93. "Leaves heart-shaped, entire, and three-lobed; flowers solitary, almost filiform." Distinct from the preceding, with which it has been confounded. Root annual. Stems long, slender, hairy. Leaves alternate, elliptic or oblong, pinnatifid underneath; lobes angular; pedicels shorter than the leaves, hairy. Flowers fine blue, with a white base; peduncles villous. Fruit cylindrical, stalked; calyxes oblong, five-cleft, hairy; corolla large, very open, almost entire, supposed to be a native of Africa. 44. C. nil. Linn. Sp. Pl. 8. Mart. 11. Willd. 27. Bot. Mag. 188. C. canescens; Ger. em. 861. fig. 1. C. hederacea angulosa folio; Bauh. p. 295. Dil. clth. 96. tab. 8. fig. 91. 92. Ipomoea hederacea; Lam. J. tras. Thun. Fl. jap. 86. Linn. Tran. 2. 330. C. hederacea; Lam. J. tras. Thun. Fl. jap. 86. Linn. Tran. 2. 330. "Leaves heart-shaped, three-lobed; corollas semi-inconspicuous; pedicels shorter than the petiole." Root annual. Stem eight or ten feet high. Leaves woolly, acuminate, on long pedicels. Flowers deep blue, with purple rays; pedicels two-flowered. Fruit erect. Nil is an abbreviation of Anil, one of the names of indigo. A native of America. 45. C. purpureus. Linn. Sp. Pl. 9. Mart. 12. Willd. 28. Bot. Mag. 113. (C. purpureus folio subrotundo; Bauh. p. 295. Ipomoea purpureus; Lam.) "Leaves heart-shaped, undivided; fruit nodding; pedicels thickened." β. caruleus minor, folio subrotundo. Dil. clth. 98. tab. 83. fig. 95. Smaller, blue-flowered, with roundish leaf. C. folio cordato glabro. Dil. clth. 98. tab. 24. fig. 97. with a heart-shaped smooth leaf. β. cha- tocr; Bot. Mag. 1005. Stems very high; leaves orbicular-heart-shaped; flowers white, with five spots, elegantly shaded with blue and carmine. All the varieties are natives of America. The first is a hardy annual, common in the English gardens, under the name of Convolvulus major. 46. C. oblongus. Linn. Sp. Pl. 10. Mart. 14. Defr. 15. Lam. 2014. Willd. 29. Dil. clth. 98. tab. 83. fig. 95. "Leaves heart-shaped, undivided; stem somewhat pubescent; pedicels thickened, one-flowered, calyxes smooth." Root annual. Stems cylindrical, villous towards the top, three or four feet high. Leaves alternate, acute, green, and smooth above, paler and a little villous underneath; pedioles one or two inches long. Flowers white, with a purple base and yellowish rays; pedicels longer than the petals, slender, lightly pubescent towards the bottom, with two small bracteae. A native of Java, and other parts of the East Indies. 47. C. flavus. Willd. 30. (Evolumus hederaceus; Burm. Ind. 77. tab. 30. fig. 2.) "Leaves heart-shaped, repand, somewhat lobed, with small mucronate teeth; pedicels bivalve, many-flowered." Stem rather smooth. Leaves acuminate, somewhat feebrous. Peduc- mcs much longer than the leaves; upper ones three-flowered; lower ones bivalve; branch with a few pedicels, with a single flower at the division. A native of the West Indies. 48. C. angulatus. Linn. Mart. 207. Mart. 12. Defr. 98. Lam. 2098. Willd. 31. Burm. Ind. 46. tab. 19. fig. 2. "Leaves heart-shaped, pentangular, quite entire, villous; pedicels many-flowered." Stem pubescent. Leaves on short petioles, quite entire, rough with reddish shining hairs. Flowers orange; peduncles the length of the leaves, axillary, solitary, most commonly three-flowered; calyx hairy; segments acute; corollas bell-shaped, three times longer than the calyx. A native of the East Indies. 49. C. Bar- tar. Linn. Sp. Pl. 11. Mart. 15. Willd. 32. (Batatas; Bauh. Pin. 91. Rumph. Amb. 5. 307. tab. 130. C. ra- dice tuberosa eculenta; Catech. Car. tab. 60. Ipomoea Batatas; Lam.) Spanish or sweet potatoes. "Leaves heart-shaped, half-axe, five-nerved; stem hispid, creeping, bearing tubers." Root perennial. Stem cylindrical, peren- nial, hispid, proliferate, creeping; sending out scattered, oblong, acuminate tubers, purple or pale on the outside. Leaves angular, on long petioles. Flowers purple, large, about three together, on a stalk as a head. A native of the West Indies; now it is said to have been introduced by the Spaniards into the Philippine islands. It is now extensively cultivated in the tropical climates of both hemispheres, for the sake of its tubers. They are sweet, fæcid, and esteemed nourishing, and are the common potatoe of our old English botanists. There are several varieties, and probably more than one distinct species. 50. C. maximus. Linn. jun. Sup. 137. Mart. 25. Willd. 33. Vahl. Symb. 3. 268. (C. marginatius; Defr. 72. Lam. 2071. Tur-tah; Rheed. Mal. 11. 109. tab. 53.) "Leaves heart-shaped, acute, smooth; pedicels many-flowered, smooth; stem somewhat hairy." Root perennial, fibrous. Stems cylin- drical, slender, reddish. Leaves alternate, thin, soft, even-surfaced, bordered with red; pedicels rather long, thick, channelled, reddish. Flowers pale red, with a purple base, funnel-shaped; peduncles axillary, solitary, thicker than the branches from which they spring; seven or eight-flow- ered; calyx-leaves short, somewhat acute; stigma capitata, two-lobed. A native of the East Indies. 51. C. biflorus. Linn. Sp. Pl. Append. p. 916. Mart. 16. Willd. 34. "Leaves heart-shaped, pubescent; pedicels very short; corollas with trifol lobes." Root annual. Stem cylindrical, hairy, branched at the base, about the size of C. arvensis. Leaves oblong; pedicels cylindrical, hairy, shorter than the leaf. Flowers white; pedicels hairy, approximating at the base, shorter than the petioles; calyx five-lobed; two outer leaves cordate-oblong; two inner ones linear-lanceolate; the fifth semi-heart-shaped; corolla small, campanulate, quinquefid, plate; lobes trifid at the tip; middle lobe smaller; tube shorter than the calyx; stigmas two, capitate, purple. A native of China. 52. C. gemelus. Mart.
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Mart. 95. Defr. 71. Lam. 2070. Vahl. Symb. 3. 27. Burm. ind. 46. tab. 41. fig. 1. "Leaves heart-shaped, somewhat villous underneath; peduncles of moderate length, channelled. Flowers in small pedunculate racemes, numerous, situated near the extremities of the branches, often pendant; bractlets very small, awl-shaped, at the foot of the pedicels; calyx-leaves smooth, egg-shaped, elongated, unequal in size; corollas bell-shaped, expanding; stigmas capitate, two-lobed. A native of St. Domingo. 58. C. finesus. Defr. 69. Lam. 2068. "Hairy; leaves heart-shaped, acute; peduncles two or three-flowered; calyx-leaves heart-shaped." Whole plant, especially near the summit, clothed with separate, fine, whitish hairs. Stems slender, cylindrical. Leaves alternate, entire, on longish somewhat villous pedicels. Peduncles shorter than the pedicels, axillary, solitary; bractlets small, awl-shaped; three exterior calyx-leaves broader than the others, heart-shaped at the base, very rough with hairs; corollas campanulate, a little longer than the calyx. Supposed to be a native of China. 59. C. pentandrus. Willd. 37. Jacq. in. rar. 2. 316. Collect. 14. 210. "Leaves heart-shaped, acuminate, smooth, somewhat repand; umbels peduncled, capitate, five-flowered; calyxes ciliate." Root perennial. Stem fibrous. "Flowers nearly sessile. Native country unknown. 60. C. guianensis. Mart. 97. Defr. 58. Lam. 2057. Aubl. guian. t. 136. tab. 52. "Leaves somewhat heart-shaped, mucronate, tomentose; flowers collected into a kind of corymbose head, on very long peduncles." Root perennial. Stems a little woody at the base, cylindrical, villous. Leaves alternate, two inches long, quite entire, veined, nerveless; petiole only half the length of the leaf, a little channelled, tomentose. Flowers pale blue, or whitish; peduncles seven inches long, axillary, villous; pedicels very short, intermingled with filiform bracts; calyxes villous, deeply divided into five lanceolate segments; corollas small; lobes of the border acuminate; stigmas two, reflexed. A native of Guiana. 61. C. capitatus. Mart. 98. Defr. 57. Lam. 2056. Willd. 37. Vahl. Symb. 3. 28. "Hilpid; leaves heart-shaped; flowers capitate, involucrated; peduncles scarcely longer than the petiole." Whole plant, hippid, with long distinct hairs of a dirty white colour, placed on minute tubercles. Stem slender, cylindrical. Leaves from two to three inches long, alternate, acute, entire; petioles nearly the length of the leaf. Peduncles axillary, solitary, with about five fiddle flowers collected into a close head. Involucrums consisting of four or five egg-shaped acute bractlets, of unequal size, generally as long as the calyx; calyx-leaves one third of the length of the corolla, ovate-lanceolate, acuminate, smooth within; corolla hippid on the outside with long hairs arranged in five lines. Cappule globular, shorter than the calyx, even-furred, smooth. Found in the East Indies by Koevery and in Senegal by Geoffroy. 62. C. eritrus. Defr. 112. Lam. 2114. "Leaves heart-shaped, almost smooth; heads of flowers very hisbute, on long peduncles, involucrated; capule even-furred." Stem herbaceous, Specimen in the herbarium of Jaffieu. 63. C. hispidus. Mart. 99. Willd. 40. Vahl. Symb. 3. 29. "Extremely hirsute; leaves cordate-egg-shaped; flowers umbellate; peduncles very short. Leaves from two to three inches long, attenuated, quite entire; petiole half the length of the leaf. Pedicels the length of the peduncle. Calyx-leaves lanceolate, attenuated, smooth within, lax. Corolla smooth. Stigma capitate. A native of the East Indies. 64. C. pareiroflorus. Mart. 100. Willd. 42. Vahl. Symb. 3. 29. (Ipomoea pancrenata; Burm. ind. 50. tab. 21. fig. 3.) "Leaves heart-shaped, acuminate, smooth; peduncles many-flowered; calyxes acuminate, villous." Stem weak, slightly villous at the top.

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Leaves an inch long; petiole the length of the leaf, filiform, villous. _Flowers_ blue; pedicels the length of the petals; pedicels umbellate; lateral ones sometimes branched; calyx-leaves egg-shaped, acuminate, small; corolla smooth, twice the length of the calyx, five-leaf; stigma bifid; segments revolute. A native of Java. 65. C. _veritissimum_. Linn. 12. Mart. 17. Willd. 43. Brown. Jam. 153. "Leaves oblong, heart-shaped, oblong, naked; pedicels umbeliate, bifid, many-flowered." Leaves rough, somewhat expanded. _Flowers_ blue, small, campulate, not cut; pedicels thinner than the leaf; pedicels often somewhat divided. A native of North America. 66. _C. foliiflorus_. (C. parviflorus; Defr. 66 Lam. 2065. Quamoclit purpurea; foliata Aiton; Lam.) Plum. MSS. 2. tab. 62. Burn. Amer. 83. tab. 94. fig. 2.) "Leaves cordate-oblong, mucronate; pedicels branched, many-flowered, short, appearing verticillate." Distinct from the preceding. Roots the thickness of the human little finger, much branched. Stems very slender, long, branched. Leaves sinuated, slightly tomentose; petals rather short. _Flowers_ purplish, small, campulate, deeply five-cleft, as represented in Plummer's figure; pedicels axillary, shorter than the leaves; pedicels forming a corymb. _Capules_ four-celled. Seeds yellow, angular. A native of St. Domingo, on fly hills, communicated to La Maree by Joseph Martyn. 67. _C. violaceus_. Mart. 101. Willd. 44. Vahl. Symb. 3. 29. "Leaves cordate-egg-shaped, acute; pedicels elongated, bifid, many-flowered; two outer calyx-leaves cordate-egg shaped, acute." Stem, petals, pedicels, and _calyces_ villosus. Leaves an inch long. _Flowers_ violet, with five laciniate pale yellow rays; pedicels four or five times longer than the leaf; pedicels three or five-flowered, with a pair of linear-lanceolate bracts at the base; calyx-leaves tender; two innermost ones only half the size of the others, somewhat membranous, smooth, mucronate; corolla campuliate; _figmas_ two, reflexed. It varies with respect to the hairiness of the leaves. A native of the island of Santa Cruz. 68. _C. aureus_. Defr. 56. Lam. 2055. "Leaves somewhat heart-shaped, acute, naked; flowers collected into a head on a very long petiole." Stem woolly, finely flabellate, firm and grevish near the bottom, twining and somewhat villous towards the top. Leaves near an inch and half long, a little longer than the petals, repenen, smooth, rather glaucous underneath. _Flowers_ azure blue, small; pedicels axillary, solitary, divided at the summit into short ramifications intermingled with small bracts; _calyces_ deeply divided; segments acute. A native of South America. 69. _C. cyllorum_. Defr. 64. Lam. 2063. (C. levis minor; Rumpp. Amb. 5. 451. tab. 158.) "Leaves heart-shaped, oblong, acuminate; pedicels cyrnose; fruit podding." _Stems_ long, slender, cylindrical, almost smooth. Leaves four or five inches long, alternate, petiolate, turned, even-serrated, slightly sinuated. _Pedicels_ axillary, about the length of the petals, branched about the middle into a cyme. _Calyces-leaves_ egg-shaped, obtuse. _Corolla_ long, not very open. _Stigma_ capitate, two lobed. A native of the East Indies. 70. _C. umbellatus_. Linn. Sp. Pl. 13. Mart. 18. Defr. 63. Lam. 2062. Wild. 45. (C. leucosolanthys; Plum. Am. 88. tab. 105. Slosin. Jam. 53.) "Leaves heart-shaped; petals pubescent at the base; pedicels umbellate." Root perennial. Stem herbaceous, cylindrical, filiform, flitt, sub-divided, pubescent. Leaves above two inches long, and as broad at the base, deeply heart-shaped, lanceolate, somewhat sinuated, entire, dark green, shiny underneath; petals three inches long, two with fly-petals at the base a little decurrent on the stem. _Flowers_ yellow; pedicels three inches long or more; partial pedicels three quarters of an inch long, three-flowered; each flower on a pedicel longer than the partial pedicels; two of the calyx-leaves a little shorter than the rest; stigma bifid, globular. _Capules_ two-celled. Seeds one or two in each cell, covered with a velvety down. A native of the West Indies. 71. _C. multiflorus_. Mart. 69. "Leaves heart-shaped, smooth; pedicels many-flowered. Seeds villous, furruginous. Root annual. Stems eight or ten feet high, slender. Leaves shaped like those of _C. icpium_. _Flowers_ purple, on rather long pedicels, growing in bunches. _Capules_ trigonous, three-celled, with one seed in each cell. A native of Jamaica. Linnzeus quotes Plunket's _Alm_. tab. 167. 11. for the preceding species; Miller for the present. 72. _C. tugurium_. Mart. 73. Willd. 46. Forth. Prod. 35. "Leaves cordate-earrow-shaped, acute; stem angular; pedicels tetragonal, one-flowered." A native of New-Zealand. 73. _C. terebinthus_. Mart. 77. Lour. Cochin. 109. "Stem shrubby; leaves cordate-earrow-shaped, smooth; pedicels many-flowered; anthers spiral." Stem large, shrubby, branched, smooth. Leaves alternate, petiolate. _Flowers_ yellow, large, campulate; anthers filiform. _Capules_ two-celled, with one seed in each cell. A native of the woods of Cochinchina. 74. _C. cordifolius_. Willd. 47. Thunb. Prod. 35. "Leaves heart-shaped, halate, toothed; pedicels bifid-umbellate." A native of the Cape of Good Hope. 75. _C. refusus_. Mart. 71. Houll. MSS. "Leaves heart-shaped, acuminate; pedicels two-flowered." Root annual. Stems even or eight feet high. Leaves on very long petioles. _Flowers_ large, of a fine rose colour, on long pedicels. _Seeds_ large, covered with a finely down. A native of Jamaica, cultivated by Miller. 76. _C. bifidus_. Mart. 103. Wild. 48. Vahl. Symb. 3. 30. (C. levis maa; Rumpp. Amb. 5. 431.) "Leaves heart-shaped, oblong, acuminate, very soft underneath; pedicels bifid, many-flowered." _C. levis minor_; Rumpp. 5. 431. tab. 158. "Leaves heart-shaped, lanceolate-oblong, smooth." Stem villous. Leaves from two to three inches long, an inch wide at the base, mucronate; petiole one-third of the length of the leaf, hoary. _Pedicelles_ axillary, solitary; pedicels numerous, somewhat umbellated, oblong, ferruginous, deciduous, with minute seclus at the base instead of bracts. _Calyx-leaves_ pubescent at the base, rounded at the tip, equal. _Corolla_ almost funnel-shaped, three times the length of the calyx, with five flatter villous lines on the outside; lobes acute, bearded at the tip. _Stigma_ capitate, two lobed. _Capules_ egg-shaped, filariated, smooth. It has the habit of _C. umbellatus_, but has no larger brown scale. The variety differs only in the smoothness, and its narrow leaves. 77. _C. malabaricus_. Linn. Sp. Pl. 14. Mart. 19. Defr. 68. Lam. 2057. Wild. 49. (Katta-keleng; Rheed. Mal. 11. 105. tab. 51.) "Leaves heart shaped, smooth; stem perennial, villous." Root perennial. Stem somewhat woody, cylindrical, weak, villous. Leaves alternate, acute, quite entire; petals reddish, thicker than the stem. _Flowers_ yellowish white, with a deep purple base; pedicels axillary, solitary, cylindrical; bractae narrow, situated near the calyx; calyx five-leaved; leaves acute, three outer ones longer; corolla campulinate, open, villous on the outside; _figma_ capitate; two-lobed. A native of the coast of Malabar. 78. _C. calycina_. Mart. 74. Lam. 212. Willd. 50. Forth. Flor. Aust. 77. "Leaves heart-shaped, very acuminate, pubescent; pedicels elongated, umbellate-trifid." A native of the island of Tanna in the South Seas. 79. _C. calamistrata_. Linn. Sp. Pl. 15. Mart. 20. Defr. 65. Lam. 2064. Wild. 51. Comm. Hort. 2. 101. tab. 51. Pluk. Alm. 114. tab. 325. fig. 1. "Leaves heart-shaped, acute, somewhat tomentose;
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soft; peduncles axillary, about three-flowered, rather long."

Root perennial. Stems woody, twenty feet high or more, cylindrical, a little branched, woolly. Leaves alternate, not deciduous, whitish underneath, on short tomentose pedicels. Flowers purple-violet or pale blue, sometimes white; peduncles axillary, longer than the pedicels, tomentose; pedicels three, rarely five or six, short, intermixed with filiform bracts; calyx very villous, with five deep acute segments; corolla a little villous on the outside; border almost flat; stigma bifid, filiform. A native of the Canary Islands. 80. C. pannosus. Linn. F. Lond. tab. 20. "Stem angular; leaves half-angle-shaped, shiny, with hairs on both sides; peduncles two or three-flowered; tube of the corolla a line and half long; segments somewhat mucronate; pericarp tender, hairy." Leaves pale green, halbarb-shaped, very hairy on both sides, like a piece of woolen cloth. Flowers pale purple, with a darker base; bracts narrow, attenuated; calyx hairy; margin of the corolla and the wedge-shaped folds of its border pubescent; filaments white, covered with a glabrous pubescence towards the bottom; anthers blue; nectarary yellow, with a whitish margin; style white, about three lines long; stigma white, longer than the style, spreading out wide, quite linear, obtuse. Capsule two-celled. Seeds two in each cell. Raised from seeds received from Lirbom by Meffrs. Lee and Kennedy. 81. C. ferrugineus. Willd. 52. Vaill. Eclog. 1. 17. "Ferruginous-downy; leaves heart-shaped, acute; peduncles axillary, four-flowered." Root perennial. A native of South America. 82. C. muricatus. Linn. Mant 44. Mart. 21. Defr. 73. Lam. 2072. 53. "Leaves heart-shaped; peduncles thickened, and, as well as the calyces, even-surfaced; stem muriuncate." Refracting C. purpureus, but the stem has a very even surface, with harmer's pricks scattered over it. Root angular, brownish purple; peduncles often two-flowered; corolla more funnel-shaped than that of C. purpureus. Distinct from ipomoea bona nua. A native of Surat; introduced into England by Dr. Solander; flowering in July and August. 83. C. acuta. Linn. Mant. 42. Mart. 22. Willd. 54. "Leaves heart-shaped; stem keeled on both sides." Stem smooth, winged from leaf to leaf with four to five membranous. Leaves three inches long, smooth, veined, obtuse, quite entire; petals nearly the length of the leaf; pedicels axillary, the length of the petals, thicker, four or five-flowered, villous; pedicels thickened, somewhat umbellled, villous; bracts two, at the base of the calyx, broad, egg-shaped, membranous, mucronate, villous, deciduous; two outer calyx-leaves egg-shaped, villos on the outside, smooth within; mucronate; inner ones only half the size, oblong; corolla twice as long as the calyx, bell-shaped; stigma capitate. A native of Ceylon and Java. 84. C. trigynus. Mart. 104. Willd. 54. Vaill. Symb. 3. 30. "Leaves heart-shaped, acute, somewhat vil- lous; pedicels many-flowered; stem three-keeled." Stem pubescent. Leaves two inches long and more; petiole villous, shorter than the leaf. Peduncle the length of the leaves, three or five-flowered; lateral pedicels often two-flowered; middle one one-flowered, shorter, gradually thickened; bracts at the base of the pedicels, egg-shaped, con- cave, tender, acute, mucronate, colored, pubescent, deciduous; two outer calyx leaves resembling bracts, egg- shaped, acute, mucronate, silky; inner ones shorter, smooth, rounded at the tip; stigma capitate. Nearly allied to the preceding, but the leaves are not obtuse, and the rings on the stem much narrower. A native of the island of Santa Cruz. 85. C. Turpethum. Linn. Sp. Pl. 17. Mart. 23. Defr. 86. Lam. 2084. Willd. 56. (Turpethum; Bauh. Pin. 149. C. zeylanicus alatus; Herm, Lugd. 177.

tab. 178, 179.) "Leaves heart-shaped, angular; stem membranous, quadrangular; peduncles many-flowered." Root perennial, about an inch thick, little branched, branching deep into the ground, throwing out thick fleshy twigs, abounding in a milky juice, which soon hardens into a re- finous substance when exposed to the air. Stems woody and reddish near the bottom, slender, with four decurrent wings, branched. Leaves alternate, crenulate, soft, clothed with a thin whitish down, slightly mucronate; pedicels shorter than the leaves, winged, channelled. Flowers white, re- snowing thofe of C. sepium; pedicules longer than the pedicels, axillary, solitary, triand; pedicels one or two- flowered; bracts two, egg-shaped, at the base of the calyx; two outer calyx-leaves egg-shaped, villous; three inner ones smooth; anthers spiral; stigma capitate, two-lobed. Capsule membranous, gloular-depressed, two-celled. Seeds one or two in each cell, black, angular on one side. A native of Malabar, Ceylon, the Society and Friendly Isles, and the new Hebrides. For an account of the medicinal qualities of the root, see Turbath. 86. C. grandiflorus. Linn. jan. Sup. 136. Mart. 24. Defr. 14. Lam. 2013. Jaccq. Hort. 3. tab. 60. (Munda-vali; Reedh. Mal. 1. 101. tab. 50.) "Leaves corollae-egg-shaped, rather obtuse, quite entire; peduncles generally two-flowered; calyces corymbose; stem and pedicels pubescent." Linn. jun. "Leaves heart-shaped, acute, on long pedi- cules short, one-flowered; corolla very large, funnel-shaped." Lam. Root perennial. Stem woody at the base, cylindri- cal, branched, smooth, about three feet high. Leaves large, with rounded lobes, smooth. Flowers very white, sweet-scented. A native of the East and West Indies. 87. C. speciosa. Linn. Sup. 137. Mart. 26. Willd. 52. C. nervosus; Defr. 87. Lam. 2083. Burn. Ind. tab. 20. 88. C. Samudra-Hoggam; Rheed. Mal. 11. 125. tab. 61. "Leaves heart-shaped, tomentose-filky underneath; pedicels longer than the petioles, umbelliferous; calyxes acute." Hort. Kew. Root perennial. Stem woody at the bottom, pub- escent, branched; branches clothed with a thick white cottony down. Leaves alternate, large, acute, quite entire, nerves underneath; petioles and pedicules tomentous. Flowers purplish, more than two inches long; pedicels five or six, very short; bracts elliptical, longer than the calyx; calyxes small, deeply divided into five egg-shaped segments. A native of the East Indies. 88. C. trinervius. Mart. 27. Defr. 16. Lam. 2015. Willd. 59. Thunb. Flor. Jap. 85. "Leaves heart-shaped, oblong, smooth, three-nerved; stem cylindrical; pedicules one-flowered." Stem filiform, simple, smooth. Leaves about an inch long, opposite, acumin- ate, quite entire, paler underneath; petals linear, smooth, half an inch long. Flowers purplish; pedicels axillary, solitary, or in pairs, very short; segments of the calyx almost bristle-shaped, smooth, half the length of the corolla; stigma capitate, two-located. A native of Japan. Defr. obsevrses, that the angularity of the opposite leaves renders the genus dubious. 89. C. petacum. Linn. Sp. Pl. 16. Mart. 28. Defr. 88. Lam. 2086. Willd. 60. Rumph. Am. 5. tab. 157. "Leaves target-shaped; pedicules many-flowered." Stem, according to Rumphius, sometimes as thick as the human thigh, and climbing to the top of the highest trees. Leaves alternate, large, some- what acute, smooth; pedicels rather long, zig-zag. Flowers white or faint purple, bell-shaped, twice the length of the calyx; pedicules axillary, solitary; calyx-leaves egg-shaped, smooth. A native of Ambon. 90. C. ficundus. Linn. Mant. 43. Mart. 29. Defr. 13. Lam. 2112. Willd. 61. Woodv. Med. Bot. tab. 21. Lam. 11. tab 104. fig. 2. (Bryonia mehoacana nigricans; Bauh. Pin. 298.)"Leaves
egg-shaped, somewhat heart-shaped, obtuse, obliquely repand, yellow underneath; peduncles unflowered. Hort. Kew. Root perennial, thick, blackish on the outside, white within, abounding in a milky juice. Stems numerous, herbaceous, ten or twelve feet high. Leaves smooth, different in shape, lower ones triangular, almost heart-shaped; upper ones more oblong and acute; pedicels long. Flowers reddish on the outside, dark purple within (yellow in the Kew Garden); pedicules axillary, solitary. Seeds covered with a very white cottony down. A native of South America, about Xalapa, between La Vera Cruz and Mexico. For its medicinal qualities, see JALAP. 91. C. macropterum. Willd. 62. (Mouroncova violacea; Audub. gymn. 1. 144. tab. 54. Jull. 133.) "Leaves elliptical, acute; smooth; corollas flat; capulcias two or three-celled, with one seed in each cell." Root perennial. Flowers falsely-shaped. Seeds almost an inch and half thick. A native of Guiana. 92. C. imbricatus. Willd. 63. Defr. 78. Lam. 1876. Pluk. Almag. 114. Phyt. tab. 169. fig. 4. "Leaves oblong-elliptical, obtuse, mucronate, nearly lefle; pedicules longer than the leaf." Root perennial, generally two-flowered. One of the least species of the genus. Stem filiform, a little villous. Leaves alternate, scarcely an inch long, and about three lines broad, entire. Pedicules axillary, solitary; bracteae two, awl-shaped, at the base of the pedicels; corollas small, bell-shaped. A native of Carolina and Virginia. 93. C. Barbadensis. (C. glabrifolium Mill. Mart. 68.) "Leaves ovate-oblong, smooth; peduncles one-flowered; calyxes ten-cleft." Root annual. Stems eight or ten feet high. Flowers purple, large, on long peduncles. Sent to Miller from the island of Barbuda. 94. C. fruticosus. Linn. Mant. 43. Defr. 77. Lam. 1875. (C. mollis; Burm. Ind. 44. tab. 7.) "Leaves lanceolate-elliptical, tomentose-filmy underneath; peduncles about three-flowered: calyx short, hairy." Stems shrubby, smooth. Leaves alternate, petiolate. Pedicules axillary, solitary, about the length of the petioles. Calyx-leaves egg-shaped, whitish, filiform. Tube of the corolla narrow to the top of the calyx; afterwards widened and terminating in a purple border, covered on the outside with white hairs. Capulcias downy. A native of the island of Java. 95. C. tomentosa. Later than the last. Mant. 31. Defr. 93. Lam. 2501. Willd. 65. Sloan. Lam. 55. hift. 1. 134. tab. 68. fig. 2. Pluk. altn. 115. tab. 167. fig. 4. "Leaves three-lobed, tomentose; frimit amunigous. Stem twenty feet high, cylindrical, whitish. Leaves alternate, reenblishing the older leaves of ivy; petioles three quarters of an inch long. Flowers purple; pedicules axillary, solitary, many-flowered, a quarter of an inch long; corollas bell-shaped. Capulcias peltaloid, acuminate, two-celled. Seeds one in each cell, black. A native of Jamaica. 96. C. quinquenervis. Mant. 105. Willd. 66. Vahl. Symb. 3. 31. "Leaves fagitate-egg-shaped, attenuated, smooth, crenate, from what repand; peduncles about five-flowered." Stem slightly pubescent, cylindrical, branched. Leaves tender, hoary; petiole shorter than the leaf. Pedicels the length of the leaves, pubescent. Pedicels in threes, umbolled, lateral ones in the greater number bident, but on the pedicules near the top all simple, bracteae two, linear, at the base of the lateral pedicels; calyx-leaves obtong, obtuse, mucronate, somewhat villous; corolla twice as long as the calyx; lobes broader at the tip; stigma bifid. Supposed to be a native of the island of Bourbon. 97. C. ceratosa. Defr. 74. Lam. 2072. Jacq. ic. rar. 2. tab. 315. (C. Hermanniz; Willd. 67. L'Hert. florp. 1. 67. tab. 32.) "Tomentous; leaves cordate oblong obtuse, somewhat repand; pedicules longer than the petiole; border of the corolla acute." 8. euflos. "Leaves less elongated, appearing bitten here and there at the edge, clothed with a reddish down; flowers larger. Whole plant whitish, soft to the touch. Root perennial, spindle-shaped. Stems about three feet long, not much branched. Leaves alternate, on short pedicels. Flower white, small; peduncles long, zig-zag, with two small awl-shaped bracteae near the top, often two-flowered; border of the corolla slightly emarginated, with five acute divisions. Found in Peru by Dombeu. The variety 8. found at Monte Video by Commeron. 98. C. althoideis. Linn. Sp. Pl. 19. Mart. 32. Def. 97. Lam. 295. Willd. 69. Flor. Gr. tab. 194. Bauhin. Pin. 295. Moris. hist. 2. 13. tab. 3. fig. 10. (C. peregrinus, folio betonicce; Tour. 85.) "Lower leaves heart-shaped, filminated; upper ones pinnatifid; somewhat palmate; peduncles generally two-flowered." Lam. 8. C. Bryoniae-folius; Bot. Mag. 943. Root perennial. Stems a foot and half or two feet high, farmentous, white, cylindrical. Leaves alternate. Flowers reddish, large, very open, almost entire; pedicules longer than the leaves, with two filiform bracteae above the middle. The whole plant cloathed with numerous hairs, so as to give it a silky aspect. A native of the Levan, Africa, and the South of Europe. The variety 8. is a much more robust plant; its leaves have no silkenk or silky whitenev; its flowers are larger and deeper colored. Raised from seeds procured from China, by Ifasa Swainson, eig. in 1802. 99. C. tenuiflorus. Smith Proe. Flor. Grac. p. 134. Pl. Grac. tab. 195. (C. althoideis 8. Linn. 99. Defr. C. althoideis; Bot. Mag. 359. 99. C. aristogatus folis tenuiter incisus; Tour. Init. 85.) "Leaves pedate, filary, remarkably shining; linear lobes obtuse; root-leaves cordate-ferrated; peduncles one-flowered." Found by Dr. Sibthorp in Candia, about Athens and in the isle of Zante. 100. C. alephalos. Lam. 2066. "Hirsute; all the leaves deeply divided, somewhat palmate; peduncles few-flowered, longer than the leaves." A native of the Cape of Good Hope. 101. C. cairicus. Linn. Sp. Pl. 21. Mart. 83. Willd. 70. Bot. Mag. 699. (C. folius lanscatus vel quinquenervis; Bauhin. Pin. 295. Barrel. icon. 319 and 320. C. egyptius; Vellin. 53. 73. tab. 74. Ipomea palmatis; Perdil. Defr. 43.) "Stem shrubby; leaves palmate-cleft, mucronate, smooth, quite entire, but often minutely crenate; hinder leaves two-flowered; filipus palmate; calyxes even surfaced; corollas ribbed underneath; divisions acute." Root perennial. Stems with many slender branches. Leaves alternate; segments lanceolate; pedicels the length of the leaves, with two leaf-like filipus at the base. Flowers violet-purple, large; pedicels the length of the pedicels, axillary, from one to three-flowered; pedicels bracteate about the middle, with two small, egg-shaped, acute scales; calyx five-leafed; leaves short, egg-shaped, acute, concave, smooth, very shining either side; tube of the corolla nearly cylindrical, contracted as far as the calyx; border spreading; filaments unequal; anthers somewhat arrow-shaped; stigma divided into furrowed lobes. A common ornamental plant in the gardens of Egypt. 102. C. quinquenervis. Mant. 107. Willd. 71. Vahl. Symb. 3. 32. "Leaves palmate-quinquelobed, finely ferrinated, obtuse, smooth; axils tomentous; peduncles one-flowered; item smooth." Stem cylindrical. Leaves nerved, finely veined, mucronate; middle lobe scarcely an inch long, lateral ones smaller, and narrower; pedicels an inch long, filiform; filipus two, alternate, petiolate, limbed in fructicule to the leaves. Flowers purple; peduncles the length of the petiole, filiform, without bracteae; calyx-leaves obtuse, obtuse, smooth; stigma capitate, two lobed. A native of the Isle of Santa Cruz. 103. C. caietica. Linn. Mant. 559. Mart. 34. Willd. 72. (C. Ripulatus; Defr. 26. Lam. 2025. C. folius laciniam, vel quinquenervis; Bauhin. Pin. 295. Barrel. icon. 319.) "Leaves pedate, ferrated; peduncles eniform, one.
one or two-flowered; calyxes nutricated. Root annual. A
stem angular, smooth, and even-surfaced. Leaves smooth, deeply
divided almost to the base; segments five, lanceolate,
ferrated or unequally toothed, mucronate by the middle
nerve; lateral ones feebly shorter; two external ones often
broad. Petioles long, channelled, feebly underset; 
diplobus similar to the leaves, but smaller. Flowers small,
white; peduncles axillary, compressed, larger than the
petioles, thickened upwards, with two bracts above the
27. Lam. 1826. "Leaves finely laciniate, somewhat
biinnipinnat; peduncles one or two-flowered; calyx of
the fruit nearly naked." About a foot and half high.
shades perfectly smooth, sometimes cloathed with fine silky
hairs. Leaves slender, cylindrical. Leaves alternate, petioloed.

Flowers white; peduncles slender, longer than the petioles,
axillary, solitary, thickened upwards; bracts two, about a
line and half long, linear, acute, fimbriated near the top of
the peduncle; calyx-leaves egg-shaped, obtuse, mucronate,
a little scarious, sometimes rather villous, especially at the
weight of flowering; corollas campanulate, twice the length of
the calyxes. Seeds black, naked. A native of South America. about
Monte Video. Specimen in the herbarium of Commercon.

There is a variety in the herbium of Thion very villous
in all its parts, especially the calyxes, with the lower
leaves less deeply divided, than the upper. 105. C. virgata.
Willd. 73. Burm. Ind. 45. tab. 18. fig. 1. Pink. alm. 135.
tab. 25. fig. 3. "Leaves palmate-five-lobed, smooth, toothed;
stem hairy; peduncles many-flowered." Leaves thick, entire.
Leaves alternate, petioloed, divided almost to the middle, hairy
underneath. Peduncles axillary, solitary, hairy, separting
into two principal branches; calyx villous; corollas campanu-
late, orange; stigma two, globular. A native of the East
Indies. 106. C. diffusa. Linn. Mart. 204. Mart. 56.
Defr. 23. Lam. 222. Willd. 74. Jacq. ob. 2. 4. tab. 28.
Hort. 2. tab. 159. "Leaves palmate, seven-lobed, dentate-
finuated, smooth; stem hairy; peduncles one-flowered." 
Root annual. Stem much branched, cylindrical. Leaves
deply palmate, almost digitate, segments acute; petioles
from one to two inches long, hairy. Flowers white, open;
peduncles shorter than the leaves, axillary, solitary, hairy
at the base; calyx oblong, smooth and even-surfaced; stigma
capitate, two-lobed. A native of America. 107. C. muc
acra. Mart. 75. Willd. 75. Forst. prod. 79. "Leaves
depressed, lobes eliato, mucronate; peduncles one-flowered."
A native of the Isle of Tanna in the fourthe
Lam. 2023. Willd. 76. (C. polypyllium, flore & fructu
purpureis maximis; Plum. Cat. 1. MSS. 2. tab. 59. Burm.
Amer. &. 50. tab. 91. fig. 1.) "Leaves palmate, pedate,
five-crested; peduncles one-flowered." Root annual, thick,
fluffy, milky. Stems long, about the thickness of a goose-
quill. Leaves deeply palmate, almost digitate, two outer
segments each deeply divided, thin, fimbriated at both ends.
Petioles longer than the petioles, axillary, thickened upwards, jointed
and bent above the middle, longiangularly winged and curved;
 leaves concave, roundish; corollas campanulate, large, light-
ly fimbriated. Capsule membranous, orbicular, angular, about
the size of a walnut. Seeds round, black, villous, about
the size of a hazel-nut. A native of Martinico, where its
Pl. 23. Mart. 48. Defr. 100. Lam. 2100. Willd. 77.
(Pal medoffe; Rhed. mal. 11. 101. tab. 49.) "Leaves
palmate; lobes seven, egg-shaped, acute, quite entire; pedun-
cles, panicleed. Root perennial, about a foot and half long,
CONVOLVULUS.

reddish above, green near the top. Leaves alternate, petioled; segments quite entire, clothed on both sides with fine decumbent hairs. Flowers yellowish white; peduncles about four inches long, axillary, solitary, cylindrical, dichotomous, often furnished with small branches at the divisions; pedicels very short; calyx-leaves acute, two outward ones longer, more hispid, and of a purplish colour; corolla campanulate, twice the length of the calyx, slightly five-lobed; stigma capitate, two-lobed. Capsule two-celled. Seed two in each cell. A native of South America, cultivated in the hoten in Paris. Miller received seeds from Carthagena in New Spain, which he cultivated under the name of C. pentaphyllus, and which differs from the above in being perennial, and having only two purple flowers on each peduncle. 113. C. quinquefolium. Linn. 252 Mart. 42. Dfr. 162. Lam. 2102. Willd. 79. Swartz. 67. Fleck. Alm. 116. tab. 167. bg. 6. "Leaves digitate, smooth, toothed; pedicels pubescent." Linn. "Leaves digitate, smooth, toothed; item hispid; pedicels many-flowered." Lam. Stems very long, slender, cylindrical, hispid, branched. Leaves alternate, petioled, smooth, bright green; segments lanceolate; middle: one enlarged, near two inches long, about half an inch broad. Flowers white; peduncles longer than the leaves, flender, axillary, solitary, few-flowered, dichotomous, from three to five-flowered, with small awl-shaped bracts at the divisions; calyx smooth, segments oblong, the three inner ones larger; corolla campanulate, five-toothed. Cappiell four-celled. Dfr. Two celled, two-seeded. Swartz. A native of the West Indies. The C. quinquefolium of Miller is a different plant. It was raised by him from seeds sent from New Spain, and is thus described. Stems thirty feet high or more, woody, with a purple bark. Leaves deeply divided into five flap-pointed lobes. Flowers large, purple; pedicels long, thick, with a bent joint in the middle. Cappiell round, as large as a mending apple, three-celled. Seeds two in each cell. 116. C. esculentus. Lam. Ill. 2193. Stems slender, cylindrical. Leaves digitate, in fives, toothed; pedicels about three-flowered, shorter than the leaf; calyx hispid. A native of Cayenne. 117. C. venetus. Mart. 128. Dfr. 101. Lam. 2105. Willd. 80. Vahl. 3. 32. "Smooth: leaves digitate, in fives; leaflets petioled, ovate acuminate; common petioles with tendril at the base." Lam. "Quite smooth; leaves digitate, in fives, quite entire; pedicels many-flowered." Vahl. Stems slender, cylindrical. Leaves petiolate; leaflets acute at the base (rather than petiolated), veined; middle one larger than the others, about two inches long; common petioles with a shorter tendril at the base. Dfr. Pedicels with an ovate-heart-shaped, acuminate, solitary leaf at the base. Vahl. Is it not properly a flipula, which, as the peduncles are axillary, may be thought by one observer to accompany the petiole; by another, the peduncle?) Flowers in a corymb; peduncles a flary, dichotomous near the top, with small awl shaped bracts; calyxes short; segments egg-shaped, two inch; corolla funnel-shaped, tube nearly of the same diameter throughout, not gradually enlarged to the top; border but little widened; ligments capitate, slightly two-lobed. Sent by Collinmion from the Isles of France and Bourbon. On a close comparison it appears certain, that Dufourneaux and Vahl have described the same plant, and have given it the same name, without any knowledge of each other's specimens. 118. C. glaber. Dfr. 193. Lam. 2104. Willd. 81. Ait. guian. 136. tab. 53. "Leaves digitate, in fives; leaflets ovate-lanceolate, quite entire, smooth; pedicels many-flowered." Dfrs. numerous, long, cylindrical, flexible. Leaves alternate. Flowers white; petals axillary, solitary; pedicels long; calyx deeply divided; segments long, firm, smooth, acute; tube of the corolla rather long; border open, with five rounded lobes; stigma two, long, acute. A native of Cayenne. The whole plant is milky. 119. C. arborescens. Dfr. 107. Lam. 2106. "Shubby; leaves digitate; leaflets about eight, linear, very narrow; seeds very hispid." Whole plant, except the seeds, hispid. Stems turmouitous, woody, cylindrical, leaves about an inch long, including the pedicels. Flowers purple, axillary, in small dichotomous racemes, shorter than the leaves; calyx-leaves obtuse, not a quarter of the length of the flowers; corolla cylindrical. Cappiell egg-shaped, five-flowered; the entire plant pubescent. Stems singular. Leaves petiolate; leaflets very narrow, entire. Petioles axillary, short; upper ones sometimes one-flowered. Calyx smooth, with oblong leaflets; stigma acute.

** Stems not twining.**

ING. STEM several, rising among a considerable number of root-leaves, from three to fix inches high, weak, zigzag, shortly angular, villous, a little branched. LEAVES alternate, smaller, but so much narrowed at their lower extremity as to appear petioled, a little channelled at the base to embrace the stem, furnished with two bracteal leaves, which are in shape and filikenes and extending a little beyond the calyx; besides these there are sometimes two other smaller bractes, shorter than the calyx; calyces small; leaflets egg-shaped, acute, silky, corollas middle-filz'd, half open, villos on the outside. A native of the south of France, and the Levant. 127. C. \textit{spicifolius.} D. fr. 41. Linn. 2039. BRAND. \textit{Leaves} linear-lanceolate, nearly simple; peduncles one-flowered, shorter than the leaf. STEM decumbent at the base, then ascending, a little zig-zag. LEAVES alternate, about three lines long, resembling those of lavender; lower ones the same length as the others. FLOWER rather large; peduncles axillary, nearly half the length of the leaves; bracteate two, linear-lanceolate, situated near the calyx, and a little surpassing it; calyx about one-third of the length of the corolla, with five acute segments; fligmas long, filiform. A native of mountains in Spain. Wilde now thinks this and the preceding the same plant; and they are perhaps nothing more than varieties; but as La Marec and Defroutteaux profess to have been both of them growing in the botanic garden at Paris, in deference to their authority we have kept them distinct. 128. C. \textit{flavicaculea.} Mart. 110. Willd. 87. Vaill. Symb. 3-33. Bar. Lc. 470 Bacch. Mof. 2. 79. tab. 70. (C. laurinoides) Defr. 47. Lam. 2046. C. argentee umbellatus fumus; Tourn. Infr. 84. Lychinus fylvicolis campanulate flor. (Bass. Pin. 262.) "Very white: Leaves inconspicuous; stem terminal heads; calyces acuminate." STEM perennial. LEAVES scarcely a foot long, cylindrical, a little branched. LEAVES an inch long, thin, flat, alternate, fleshy, fatting on the young shoots. FLOWERS white, with a flight tint of purple, fffile, wide, or ten collected into a head at the extremity of the branches, which are commonly without leaves below to the extent of two inches, surrounded with a form of involucre consisting of five or fix rather broad leaves; each flower surrounded with some small linear bractes; calyces divided to the base into five segments, about half the length of the corolla. 129. C. \textit{Carum.} Linn. Sp. Pl. 50. Mart. 47. Willd. 3 Flor. Grec. tab. 100. Bar. Mag. 459. (C. argentee) Defr. 48. Lam. 2047. C. argentee umbellatus cretaceus; Tourn. Infr. 84. Monf. H. 2. 11. tab. 3. fig. 1. Cneorum album, folio argenteo mol. (Bass. Pin. 493.) Dorycium; Cluf. Hf. 3. 254. "Leaves lanceolate, tomentose; flowers umbel'd, calyces buffy; item tomentos." Linn. "Shrubby, silky; leaves oblong, obtuse; flowers in terminal, capitulate umbels; calyx short, somewhat reflex." Stem. Root perennial. STEM about three feet high, slender, firm, upright. Leaves numerous, flattened, about an inch and half long, four or five lines broad, fffile, narrower at the base, soft, clothed with a fine decumbent, silky, brilliant down. FLOWERS white, tinged with a pale red, on short peduncles; bracteate resembling the leaves, but smaller; calyces about a third of the length of the corolla, short, obtuse, deeply divided, villous; corolla silky on the outside; border rather open. A native of Candia and the islands of the Levant. 130. C. \textit{oleifolius.} Defr. 49. Lam. 2048. "Shrubby, silky; leaves linear-lanceolate; flowers in terminal capitulate umbels; calyxes lanceolate." A native of the Levant; nearly allied to the preceding, and scarcely more than a variety. 131. C. \textit{lancinit.} Willd. 89. Bot. Mag. 289. "Stems erect, shrubby; leaves linear, acute, clothed with silky hairs; flowers terminal, umbilicate-panicled; calyces hairy." Conformed by the English nurseriesmen with the next species. Most allied to C. canerium, but differs in having leaves much narrower, more pointed, and less silky. 132. C. \textit{canerium.} Linn. Sp. Pl. 31. Mart. 48. Defr. 46. Lam. 2045. Willd. 90. Jacq. Flor. Aul. 3. tab. 295. (C. linearis folio; Bass. Pin. 205. C. linearis folio affugenus; Tourn. Infr. 57.) "Leaves linear, acute; item branched, somewhat dichotomous, calyxes hairy." Linn. "Hairly; leaves linear-lanceolate, acute; item branched, rather erect; flowers clustered." Lam. B. C. terebellus; Linn. Sp. 27. Whole plant clothed with fine whitish hairs, fast to the Flower scanty, pale white, fbrn a foot high, cylindrical. LEAVES two or three lines broad, alternate, fffile. FLOWERS rose-coloured or white, almost fffile, growing two or three together at the end of the stem and branches; bractes linear, acute, resembling the leaves but smaller; calyces with five acute segments; corollas middle-filz'd, open, almost flat; fligmas two, filiform. A native of the south of Europe. 133. C. \textit{fusifolius.} Smith Prod. Flor. Græc. p. 135. Desf. Att. tab. 48. "Leaves linear-lanceolate; item ascending, villous, peduncles axillary, unflowered, three times the length of the leaf." STEM perennia. A native of Barbary and Greece. 134. C. \textit{Amazanii.} Defr. 40. Lam. 2038. (C. ramosus, erectus, argentee minimus; Amm. Ruth. 5. n. 6.) "Silky; leaves linear; peduncles one-flowered; bractes long; calyx acute." Whole plant armed with a short silky filyvew down. STEM perennial. STEM from four to six inches high, slender, cylindrical, branched, rather erect. LEAVES alternate, fffile; root-ones not less than half an inch long, narrowed at the base, obtuse; those on the stem and branches longer, acute. FLOWERS in terminal, pale white, flarin a foot high, cylindrical. LEAVES two or three lines broad, alternate, fffile. FLOWERS rose-coloured or white, almost fffile, growing two or three together at the end of the stem and branches; bractes linear, acute, resembling the leaves but smaller; calyces with five acute segments; corollas middle-filz'd, open, almost flat; fligmas two, filiform. A native of Siberia. 135. C. \textit{fusifolius.} Defr. 45. Lam. 2044. Willd. 92. (C. originales, humifolius; pilofelius folius; Tourn. Cor. 1.) "Leaves lanceolate, fffile, entire; peduncles elongated, many-flowered, loosely branched." Root perennial. STEM cylindrical, slender, slightly hairy, decumbent. LEAVES alternate, three or four lines broad; fssile especially at the edges, with long separate hairs. FLOWERS small, campanulate; peduncles from four to six short; calyces small, flarin a foot high, cylindrical. LEAVES numerous, flattened, about an inch and half long, four or five lines broad, fffile, narrower at the base, soft, clothed with a fine decumbent, silky, brilliant down. FLOWERS white, tinged with a pale red, on short peduncles; bracteate resembling the leaves, but smaller; calyces about a third of the length of the corolla, short, obtuse, deeply divided, villous; corolla silky on the outside; border rather open. A native of the Levant. 136. C. \textit{dorycium.} Linn. Sp. Pl. 28. Mart. 49. Defr. 38. Lam. 2039. Willd. 95. Linn. Sp. Pl. 291. (C. ramosus, humifolius; pilofelius folius; Tourn. Infr. 57.) "Leaves linear, silky; item shrubby, panicked; calyces almost naked, obtuse." Root perennial. STEM a foot and half high, cylindrical, almost smooth, a little zig-zag, much branched, with few leaves, ascending towards the top. LEAVES alternate, fffile, narrow. FLOWERS generally filitary, fssile in the forks of the branches or at their summit, commonly accompanied with one or two small leaves; calyces very small; corollas campanulate, open, villous on the outside, three or four times the length of the calyces. A native of the Levant. 137. C. \textit{proserpa.} Willd. 34. Vahl. Eclog. 1. 18. "Leaves linear, fssile underneath; heads of flowers
blue on the upper part of the border; peduncles just above the leaves on the same side about two inches long. A native of Spain, Portugal, Sicily, and the coast of Barbary. It is generally called 
Amer. 9. tab. 125. "Leaves oblong-lanceolate, somewhat
halate; peduncles elongated, one-flowered; stem creeping."

Root perennial. A native of South America. 151. C. 
Lam. 2029. Willd. 107. (Ipnoma aquatica: Forsk. Arab. 44. 
Baili: Rheed. Malt. 11. 107. tab. 52.) "Leaves arrow-
shaped, obtuse behind; peduncles one or two-flowered.

Root perennial. Stem creeping, jointed, rooting, angular, 
compressed, subdivided. Leaves crowded, terminal, emargi-
nate, smooth, somewhat succulent, on long-petioled. Flowers 
whitish, rather large; peduncles from the axis of the 
terminal pedicels, erect. A native of the East and West Indies. 
Wild. 108. (Olius vagum: Rumph. Amb. 5. 419. tab. 155. 
fig. 1.) "Leaves lanceolate, auricles rounded; stem 
creeping; peduncles one or two-flowered."

Root perennial. Stem filiform, smooth and even. Flowers 
white, acuminate. Flowers purple, peduncles shorter than the 
based"; Calophyllum. C. soldanella, twilled, with 
two feeds in each cell. A native of the East Indies, 
China, and Cochinchina, where it is used as a potherb. 153. 
Wild. 109. Thunb. jap. 84. "Leaves heart-shaped, entire 
et the leaf; 3-lobed, smooth; stem rooting, angular."

Root perennial, often as big as the human fist, tubercled, fibber like 
C. batatas, eufulent, soft, and fastid. Said to be brought to 
Pl. 38. Mart. 60. Debr. 83. Lam. 2081. "Leaves heart-
shaped, somewhat haleate, villous; stem and petioles hairy; 
peduncles many-flowered."

Root annual; Stem a little 
twining. Leaves but little hairy. Flowers alternate, pe-
dicelled, smooth, on peduncles longer than the leaves; 
involucres of to each pedicel, small, lanceolate. A native of 
Mart. 61. Engl. Bot. 514. (C. maritimus nother rotundifolius; 
Tourn. 83. Soldanella maritima minor; Bauh. Pin. 
293.) "Leaves kidney-shaped; peduncles one-flowered, 
with winged angles." Dr. Smith. Root perennial, long 
creeping. Stems five or six inches long, procumbent, few-
flowered. Leaves alternate, petioled, entire or a little angu-
lar, smooth and even, somewhat thinly. Flowers bell-shaped, 
emarginate, yellowish at the flaps; peduncles axillary, solitary, 
erec; thickened near the top, quadrangular; bracte 
estigate, close to the flower; calyx-leaves large, egg-
shaped. Capeflor three-celled. Seeds black, one in each 
cell. A native of the sea coasts of Great Britain, and other parts 
of Europe. It abounds in a milky juice, which has a bitter, 
acrid, faerie taint, and is esteemed a good purgative. 156. C. 
(C. Stoloniferus; Debr. 43. Lam. 2041. Cyril. Pl. rar. 
Tace. 1. 14. tab. 5. Soldanella vel bracifica maritima major; 
Bauh. Pin. 293. C. maritimus major italicus; Tourn. 
Init. 83.) "Leaves panduriform, or entire, emarginate, 
heart-shaped; peduncles one-flowered; corolla bell-shaped; 
stem creeping." Vahl. "Procumbent; leaves egg-shaped, 
retuse, emarginate; lower ones undivided; upper ones fin-
ately lobed at the base." Lam. Nearly allied to the preceding. 
Root perennial. Stem cylindrical, quite smooth, a lit-
tle branched, extending far on the sand, rooting at the knots. 
Leaves alternate, smooth, shining, on long petioles. Flowers 
white, yellowish white; peduncules axillary, solitary, or in pairs, 
nearly the length of the petioles, with two small bracts; 

Calyx-leaves egg-shaped, obtuse; stigma capitate. A native 
of the sea-shore in Italy. 157. C. annuus. Mart. 83. 
oblong, emarginate, lobed at the base, or entire; peduncles 
pointed; corolla tubular," Whole plant smooth. Stems 
decumbent, filiform, zig-zag, purplish. Leaves clustered, 
veinless; pedicel longer than the leaf. Peduncles in pairs or 
Solitary, axillary, the length of the petioles; calyx-leaves 
equal, oblong, somewhat succulent; tube of the corolla 

enlarged gradually towards the top. A native of the Azores. 
158. C. maritimus. Debr. 44. Lam. 2043. Plumb. phyto- 
tab. 24. fig. 5. "Leaves emarginate, two-lipped, wedge-
shaped at the base; peduncles many-flowered; stem decum-
ent, throwing out roots." Whole plant smooth. Stems 
cylindrical. Leaves alternate, mucronate by the elongation 
of the principal nerve, entire, thick, fleshy; pedicels chan-
nelled. Flowers purple, large, bell-shaped; peduncles from 
to fix-flowered, generally longer than the pedicels, 
cylindrical, divided above the middle, and furnished at the 
divisions with small awl-shaped bracts; calyx-leaves egg-shaped, 
slightly mucronate. Capeflor roundish. Seeds four A native 
of the Isle of France, and of the East Indies. 159. C. 
(C. maritimus S.; Debr. Lam. Ipomea biloba; Fork. C. 
maritimus alatus; Linn. Sp. Pl. 175. C. marititus; 
Rumph. Amb. 5. 433. tab. 159. C. maritimus five 
Soldanella e Mederaerifinian. Plumb. phyto-tab. 24. fig. 4. 
Schoeros-adaambo; Rheed. Malt. 11. 17. tab. 57.) "Leaves deeply 
emarginate, crescent-shaped, truncate at the base; peduncles 
often one-flowered." Root annual. Stem somewhat flabby, 
procumbent, creeping, a little villous, red. Leaves thick, 
tomentous. Flowers purplish. A native of the East Indies, 
China, Cochinchina, and the eastern coast of Africa. 160. 
(C. maritimus S.; Debr. Lam. C. maritimus; Brown. Lam. 
C. maritimus; Plumb. Amer. 88. tab. 104. Marcgr. bras. 
51. Pis. bras. 258.) "Leaves slightly emarginate, roundish, 
egg-shaped, often three-flowered." Stem perennial, 
trailing to a great distance. Leaves larger than those of 
the last two species; pedicels marked near the leaf with two red 
spots. Flowers large, purple; peduncles long. Capeflor 
large, three-celled. Seeds one in each cell. Whole plant 
milky and a strong purgative. A native of the coast of 
Brazil, and of the Straits of Magellan. 161. C. multiflorus. 
Willd. 115. Thunb. prod. 55. "Leaves palmate; lobes 
linear, entire; peduncles one-flowered; stem decum-
ent," A native of the Cape of Good Hope. 162. C. 
Wild. 116. "Stem procumbent; upper leaves 
reduced to the tip; flowers capitate."

Root annual. Leaves 
little villous; lower ones heart-shaped; upper ones repand 
and almo lobed. Flowers aggregate, three together, fel-
ile, parallel, with a fix-leaved involucre. Flowers large. 
A native of the East Indies. 163. C. capetis. Willd. 117. 
Thunb. prod. 35. "Leaves haleate; lobes semibifid; ped-
uncles about two-flowered; stem decumbent, villous." A 
native of the Cape of Good Hope. 164. C. nigroflora. 
Willd. 118. Thunb. prod. 35. "Leaves haleate and ar-
row-shaped; peduncles one-flowered; stems prolamate." A 
native of the Cape of Good Hope. 165. C. littoralis. Linn. 
119. (C. albus, folio laciniato, maritimus, Plumb. Cat. 1. 
Burm. Amer. 79. tab. 90. fig. 2. Tourn. 84.) "Leaves 
oblong, lobate-palmate; peduncles one-flowered; stem 
creeping." Stem very long, much branched, nearly the thick-
ness of a goose-quill, white, tender, creeping and taking 
root. Leaves a little larger than the palm of the hand, 
palmate
CONVOLVULUS, in Rural Economy. See Bind-weed and Weed.

CONVOLUTION. A winding or turning motion, proper to the trunks of some plants; as the convoluted, or bind-weeds, and the clasps of ripples, and brobiny.

Dr. Grew thinks, that all those plants whose roots are twined, have such a convolutions; and he assigns two great efficient causes of this winding motion, the sun and the moon. It is very easy to try whether there be any such convolutions or not in the trunks of plants; which may be done, as he hints, by tying a little bit of paper to any of the branches which are exactly north, south, &c. and then seeing whether it will change its position or not, in respect of the point of the compass.

CONVOY, from the French convoyer, to conduct, escort. In Maritime Language signifies one or more vessels of war, entwined with the conduct of a fleet of merchants, serving as a watch, and a shelter from the infults of the enemies of the flate to which they belong, or of pirates.

CONVOY, in Mechanics, denotes a brake, grapple, or regulator for moderating the velocity of tram or rail-way waggons on steep parts of the roads; in some infallances waggons heavily laden with coal, limestone, &c. defend for considerable distances on steep rail-ways, without horses, and regulated only by a man who rides behind them and stands upon the convoy; as from Whitley-stick to the Bradford-Canal in the West Riding of Yorkshire, and other places. Horses are used to drag the empty waggons up the hill again. See our articles Canal and Rail-way.

On some railways, where the trade is a declining one, and the declivity in some places 12 to 16 inches in a chain, the horses, in holding back to moderate the velocity of the trains, are very liable to be thrown down and much injured, and even killed by the momentum of the trains; for obviating this evil, Mr. Charles Le Cain contrived a convoy, check, or flop, a model and description of which he presented to the Society of Arts in 1825. (See Transactions, Soc. Arts, xvii. 316.) in which the convoy, in form of circular wedges, to set before the front wheels of the trains, is suspended by chains from the shafts by which the horse draws the train, so as to cause no impediment to the motion of the wheels, as long as the horse is on his legs, and the shafts nearly in an horizontal position; but in case of the horse falling, and the shafts by that means declining downwards, the convoy instantly drops and stops the further progress of the wheels on the tram-plates; other kinds of convoys and stoppers are described in our article Canal.

In 1805, Mr. F. D. Walker applied a similar principle to that of Mr. Le Cain's convoy, to the shafts of a four-wheeled carriage called a socable; which convoy, on being let down by means of a pedal action on the coachman's foot, checked the motion of the four wheels in descending steep hills, and greatly secured the carriage and passengers. In 1827, two years this contrivance has been used with perfect success by Mr. Walker in frequently descending very steep hills, without locking the wheels.

CONVOY, in Military Language, denotes some succour or supply of men, money, ammunition, provisions, food, &c. conveyed in time of war by land or water, to a town or an army. A body of men, that marches to protect any thing, and prevent it from falling into the hands of an enemy,
CONVOY.

An officer, who has the command of a convoy, should take all possible precautions for its security, and should endeavour, before it marches, or sets out, to procure good intelligence concerning the enemy's out-parties. And as the commanding officer of the place, from which the convoy is to set out, and those of other places, by which it is to pass, are the most proper persons for him to apply to for assistance, he should take such measures as will enable him to keep up a constant intercourse with them. The conducting of a convoy is one of the most important and most difficult of all military operations. The strength of the detachment employed to escort a convoy should have a reference to the importance of the convoy itself. For there are cases when the escort should be commanded by an able and experienced general.

When it may be necessary to pass the night in the open fields, the custom is to encamp, that is, to form a close with the waggon, for the troops to sleep in, and this is a good precaution against any unexpected attempt of the enemy to surprise them. But if they should find themselves on the point of being attacked during the march, urgent necessity alone should constrain them to adopt this method; and especially the consideration of their being very inferior to the enemy, since they would thus tie up their own hands and render it impossible for themselves not to surrender, in case it should happen that they were not feasonably relieved. When the convoy is considerable, when it is to pass places in the hands of the enemy; and when it runs any risk of being attacked; it ought to have a large escort, which is to be disposed in such a manner as to cover the convoy, instead of being covered by it. And as soon as the commanding officer hears of the enemy's being at hand, he is to leave a few detachments to accompany the waggon, and faze them from such of the enemy's parties as might attempt to turn them into a wrong road, or break their chain; and assembling the rest of his troops, infantry as well as cavalry, seize the most favourable post within his power, to stop the enemy, or fight him, if he cannot avoid it. In the mean time, the convoy is to make the belt of its way, and to get as far from the danger as possible. Should the troops, at any time, think it proper to cover themselves with the wagons of a convoy, they should be made to march in two columns, at a small distance alender; and if the files should prove too long in two columns, they must be formed into three or four. In this disposition, which, however, the ground will not always allow of, as soon as the enemy is observed to be preparing for a serious attack, the horses are to be immediately unhamstrung, and removed, not only that the waggon may be brought more closely together, so as to form a rampart, but to fave the horses, of which, otherwise, so many might be lost, as to render it necessary, even after repulsing the enemy, to abandon part of the convoy. This must also be the case, if the troops should be stopped, and obliged to fight in their march, as it would be impossible that several horses should not be maimed or killed. It appears, therefore, that, in order to save a convoy, the troops should not think of covering themselves with it. If at any time a retreat should be necessary with a great number of baggage waggon, the retreating troops should not think fo much of the protection they might afford, as the embarrassments they must create. The 10,000 Greeks rid themselves of theirs; and, confining themselves to some beasts of burden, took the resolution of fighting, uncovered. Moreover, regard should be had to the country which the troops are to traverse, and the kind of enemy with which they have to contend. If the country is an extensive plain, and the enemy very strong in cavalry, like the Turks, the waggon may prove of great service; besides those for the baggage, which in cases of necessity may be used for that purpose, the army should provide itself with some of those belonging to the inhabitants, to carry the chevaux-de-feu, and the sick and wounded.

CONVOY, Order of, in Naval Tactics, denotes that which a fleet holds in making a straight course; the ships being all in the wake of one another, fleeting on the same point of the compass, and forming a right line. This order, according to M. Boucic. de Villeneuve, is the midst simple, and the only one a fleet should form from the following reasons:—it is easily preserved; it cannot be disposed in 20 out of the 32 shifts of wind; and is easily reformed in the 12 other changes; and it is easy to pass from that order to those that are proper for the security of a fleet, in all possible cases, either to preserve one's self, to attack, or to defend. If the fleet be numerous, the ships are to be arranged parallel to one another, that of the admiral occupying the middle, and fleeting all the three course.

To form the order of convoy in one line. When the fleet is in no particular order of faying, the leading ship is to rear sufficiently for the others to get in her wake, and fleeting the fame course she holds. The commanding officer generally takes this post, when the squadron is not numerous. That the order may be the sooner formed, every ship of the fleet or squadron should chase at the same time that which is to be a-head of her, taking care to manoeuvre in such a manner as to avoid running foul of those which cross her fore-foot in endeavouring to join her leaders in the line. Therefore, such ships as are to keeward of others should take care not to perfit obliquely in weathering them; but they must back, or go a-lern, if necessary, by keeping away a little more. Such as should already be in the column, and are to be more a-lern, must bring to till they are in their polls, or fland on under a very easy fail, that each ship may contribute to the celerity of forming the order.

To form the order of convoy in three columns. The leaders of each of the three divisions are to place themselves in a line right abreast of one another; and at a proper distance between themselves, according to the length of the columns, which will accelerate the disposition. Then every ship of each particular squadron, chasing that which is to be next a-head of her, will come and take their station a-lern of one another at the rear of the leading ship of the division, and fleeting directly after her. This order, which in practice is easily maintained, has the advantage of keeping the fleet close and connected, without causing any delay in its progress. The belt sailors can regulate their velocity by that of those which are inferior to them in faying; and they, on the other hand, may, with a little attention, carry as much fail as the weather will admit, by which means all imaginable courses may, without breaking, be fleeting.

To change from the order of convoy, in one line, to the order of battle, continuing on the same tack. The headmost ship is to haul close by the wind on the same tack, and the rest of the fleet are to make the same movement in succession, fleeting the proper distances from each other.

To change from the order of convoy, in one line, to that of battle on the other tack. The headmost ship is to veer and to come to the wind on the other tack; then all the vessels of the fleet are to perform the same manœuvre in succession. Otherwise, after having formed the order of battle on the same tack, as before, the van-ship is to tack; and all the ships of the fleet are to follow in succession, to form the order of battle on the other tack. Or, if you are fleeting a
course in the order of convoy, 4 points large, the order of battle on the other tack may be formed at once, by all the ships veering or flying together.

To change from the order of convoy, in three columns, to the order of battle on the same tack. If the fleet has the wind on the beam, or between close-hauled and eight points large, (See Plate I. Naval Tactics, fig. 1.) the ships of the lee-column are all to bring to at the same time. The other two columns flound on. When the leader of the weather-column brings the lee leader to bear on the close-hauled line, he tacks, and is followed in succession. The centre-column does the same. But as the weather-column has a greater distance to run, it must make all possible sail, while the centre-column need not make so much. Hence, the weather-column is not to begin to haul its wind till the centre-shifl of the weather-column has got on the close-hauled line. The lee-column is to follow in the same manner, when the centre-shifl of the centre-column is close by the wind.

If the wind be more than eight points, or right aft. (fig. 2.); the column which is to form the van-guard in the order of battle is instantly to haul its wind in succession, with all fails fet; while the two others, continuing their course, will put themselves successively by the wind, on the close-hauled line upon which the order of battle is to be formed, and consequentv in the wake of the weather-column.

If the columns be close on a wind, it then becomes a case within the usual fifth order of failing. See Order of Sailing.

To change from the order of convoy, in three columns, to the order of battle on the other tack. The fleet may be put first in order of battle, on the same tack; then, making the ships tack in succession, they will be in order of battle on the other tack. But the time of evolution may be diminished, (fig. 3.) by making the two weather-columns bring to, when failing between close-hauled and eight points large, while the ships of the lee-column veer in succession, and keep their wind on the other tack. The centre-column of the lee-column having veered, the centre-column is to fill, the leader of which bears away, running exactly with the wind right-aft, and is followed in succession by the ships of his division, till they are in the wake of the lee-column, then on the other tack; when the leader of the centre-column hauls by the wind, the ships of his division hauling in succession. When the centre-column of the centre-column has bore away, the weather squadron manoeuvres in the same manner, and thereby completes the order of battle.

To change from the order of convoy to that of retreat. Whether the fleet be the order of convoy in one line or in three columns, they are first to form in the order of battle on the same tack; and thence they are to pass to the order of retreat. See Order of Sailing.

To change from the order of battle to the order of convoy, in one line, on the same tack. The van-ship is to bear away as far as the intended course, and the rest are to execute the same movement in succession; so that when the rear-ship shall have made the same movement, the evolution will be completed, and the order of convoy formed on the same tack.

To change from the order of battle to the order of convoy, in one line, on the other tack. The van-ship is to tack and run one point large, till she can bear away, under the stern of the rear-ship, as far as the course which the fleet is to hold. All the ships are to perform the same manoeuvre at the same points, to charge the order and get upon the other tack. The van-ship, instead of tacking, may veer and run a little time before the wind, before getting on the other tack; then she will have to the wind on the fleet's course, without fear of breaking through the rear. This movement is shorter and preferable, since the order of convoy is nearer held by the wind.

To change from the order of battle to the order of convoy, in three columns, on the same tack. The three leaders of the columns are to bear away together, and flter on the intended course; then the ships of each squadron are to execute the same movement in succession, following the same direction; so that the three rear-ships, veering at the same time in the wake of their respective columns, will complete the evolution. The columns will find themselves too distant from each other; but, as there is nothing which disturbs them, and they have the wind right-aft or very large, it will be easy for them to close as much as may be necessary.

To change from the line of battle to the order of convoy, in three columns, on the weather-tack. The three leading ships of the columns are to have in on the same time, and bear away on the perpendicular of the wind on the other tack; then the ships of each squadron are to perform the same movement in succession; and when the rear-ships shall have turned about and be in a line with their respective columns, and the leaders of the weather-divisions shall, by crowding all the sails, have come abreast of the van-ship of the lee squadron, the evolution will be completed. If the fleet is to bear more large than the perpendicular of the wind, it will be easily formed, by making the leaders and their columns bear away in succession, then putting afterwards the columns at the necessary distance from each other.

To change from the order of retreat to the order of convoy, in one line. One of the wings is to haul together close by the wind, on the same tack as the line of bearing on which they are formed, in order to bear away in succession at the point of the angle, in the wake of the other wing; the ships of which are to run with the wind four points large, on their line of bearing; and, when the last ship of the weather-wing is in the wake of her line, the order of convoy is formed. If it be necessary to bear more large, or if you would not keep away so much, the same ships may keep their wind more, and follow the van-ship in succession.

To change from the order of retreat to the order of convoy, in three columns. First form the order of battle, and pass from that to the order of convoy, in three columns.

To restore the order of convoy in one line, when the wind comes a-head more than close-hauled. The order of convoy, it is plain, cannot be disturbed by all the tiffs of wind as long as it is more abait than the starboard and larboard lines of bearing; because the ships, steering large in the wake of each other, can easily maintain their poHs, having only their sails to trim, whether the fleet be in one line or in several columns. But if the wind draws more a-head than one of the lines above mentioned, it is evident that the ships being obliged to veer, or pay off, all at the same time, on the same tack, the order will be disturbed. In order to restore it on the same tack, when the fleet is in one line in the order of convoy; if we suppose the fleet steering large on the starboard tack, and the wind comes suddenly right a-head, which would throw all the fails flat a-back on their masts, the van-ship is to cast away to port, and bring to on the starboard tack, while all the other ships of the fleet are to box off, together and at the same time, to starboard, and make all fail, in order to come with eckerty close by the wind on the larboard tack, and get into the wake of the van-ship, then to tack and take their stations successively, under an easy fail, and bringing to likewise till the rear-ship, which has a good way to run, be in her port. If you should wish to get on the other tack, then the van-ship is to cast to starboard,
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flaard, to bring to on the larboard tack by the wind; then the r.o.l. of the first would call the other way, to tack afterwards successively in the wake of the ship which lies to, and take their station there, as has been said before, with this difference, that, after the relaxing of the order, you would find yourself on the larboard tack. If the sudden shift of wind be not quite a-head, or if it be fixed points, or between fixed and twelve, the van-ship is, nevertheless, to bring to on one tack, while the r.o.l. of the fleet, calling on the larboard, make all fail to gain her wake, to tack there, and thus regain their stations. The order of convoy may be restored by a shorter and more simple method, which, however, will cause the fleet to drop to leeward more than the former does. In the same case as the fail, when the wind comes right a-head, the whole fleet is to pay off on the same tack, if the ships are all on one line, and the rear-ship must bring to, while the r.o.l. of the ships running five points large (if the wind has shifted fixed points beyond the direction of cloe-hauled), will come and bring to successively a-head of the van-ship, on that line of bearing which they are to hold, observing that such ships are to carry a greater and proportionable press of sail, as being nearer the van-ship, they have consequently more way to run before they can regain their poils. To know how many points or degrees the weather-ships have to run large to get into their stations, add eight points or go degrees to the half of the points or degrees the wind has shifted beyond one of the two lines of bearing; and, in regaining your poils, you will have the number of points by which you differ from the first course you steer.

To restore the order of convoy, in three columns, when disturbed by a sudden shift of wind right a-head. In this case, the whole fleet must call the same way all together, leaving the three van-ships of the columns lying to, close to the wind on the tack on which you purpose to continue cloe-hauled, while the ships of the three columns running large all together on a course (to leeward of the first), which must always be determined by half the number of points or degrees the wind has shifted beyond the direction of cloe-hauled, added to eight points or go degrees, will bear away with care for their stations in the cloe-hauled line of bearing, which they are to hold to the windward side of their rear-ship, where they will arrive successively, by carrying more sail according as they may be nearer to the van, be cause in that case they have a greater distance to run.

We shall close this article with some remarks on the convoy of merchant ships, under the protection of men of war. For the due care of a large fleet, the convoy should have a number of frigates, distributed a-head, a-fern, and on the wings of the fleet, which is always to be kept in the order of convoy, on three, four, five, or six columns, according to the number of which it is composed; some other frigates are also to be sent on the look-out, to defend what passes at a distance, and to give timely warning of the approach of the enemy. If these should discover an enemy of superior force, they should make it answer by signal; and it may be advisable that they should steer a different course from that of the fleet, in order to deceive the hostile ships in sight. The men of war are to hold themselves in the order of convoy a little a-head, and to windward of the weather-column of the fleet; because they will then be able readily to attend wherever their presence may be necessary: the frigates will, with alacrity and exactness, repeat their signals from one to another, that their purport may be expeditiously known to the commanding officer, who must not neglect to have all suspected and neutral ships chased, and even flapped by the frigates, which are always to be supported by one or two line of battle ships, according to the exigency of circumstances. The prorefs of the whole fleet will be regulated by that of the war-going ships; which, however, are to be abandoned, when found to be too great a loss of time; for to risk a small and partial loss, is better than to expose the whole fleet by delay. Between the columns, there should be frigates of war and other sort falling light to be, to maintain order, and keep the ships in their stations. Their particular business will be to make the tarry ships fall with greater expedition, to oblige those ships that are out of their poils to resume it, and in the evening to give an account to the frigates, having charge of going the round, of those which have not manoeuvred well; and these will make their report to the commodore.

During the night, the same order will be observed, except with respect to the look-out frigates, which are to be called in within a certain distance of the fleet, and which are to be allowed lights as well as the rest of the men of war. They are to take special care to oblige all frigates ships to return to the convoy, and to fire, without hesitation, on all strange vessels coming from the main sea, in order to give the alarm. Every night they are to be supported on the wings by some line-of-battle ships. Elements and Practice of Rigging and Shippmanship, vol. ii. pt. 1.

CONUS, in Conchology, a genus in the Linnean system, distinguished by that writer as having the shell univalve, conulated, and turbinated; aperture eufuse, longitudinal, linear, without teeth, and entire at the base; pillar smooth. Animal a limax.

Species.

*M. truncatus. Spiire nearly truncated.

Marmoreus. Shell conic, brown with ovate white spots; whorls of the spire canaliculated. Linn.

Inhabits the Asiatic and American seas, and comprehends several distinct varieties. The shell is finely fluted, and varies from fulvous to blackish; the spots are often of triangular shape, and running into bands; whorls emarginate, and armed with fimbrious tubercles.


A scarce species. The shell is generally marked with two yellowish bands. Supposed to be from the East Indies.

Litteratus. Shell conic, white with brown dots. Linn. Voluta mescehia, Rumph.

Inhabits the Asiatic ocean, and varies from white to reddish, or yellowish; the spots or dots are usually of a somewhat quadrangular form disposed in rows, between which are a few pale yellow bands or chestnut coloured lines; the spire is fluted with brown.

Generalis. Shell conic, polished, spire flat and canaliculated; whorls canaliculated. Gmelin.

A native of India. The column of this shell varies from brown to yellow or orange, and is encircled with red, three, or four bands, marked with elongated spots; spire whitish, varied with undulated flaps, and pointed in the middle.

Virgo. Shell conic, with the base bluish. Linn.

Several varieties of this African species are described by Knorr, Litter, and Chemnitz, from which it appears this shell varies from white to yellow, or yellowish, and is sometimes tesselated with white and red, or white with a fawn coloured band; spire blue, or white marked with ochraceous band.

Capitatus. Shell conic, globulce, with the base brown; spire a little convex. Linn.

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Few distinct varieties of this species are described by Gaullier, Banani, and other writers. It is a native of Africa, and is commonly either of an olive, brown, or chestnut, or varied with these colours, and marked with one or two white bands, undulated spots, and numerous rows of dots; spheric in general triplicate. This is an Atlantic shell.

Triennis. Shell white, with three yellowish bands, spotted with chestnut; spheric a little convex; and the base transversely striated. Gmel.

Described on the authority of Martini, who has given a figure of it in his work on Conchology; its native country is unknown. The shell is marked with a few waved chestnut lines.

Miles. Shell conic, rough, with the base brown; spheric convex. Gmel. Psuedo-archilhalajfus, Argenv.

This shell is a native of India, and is of a white or yellowish colour, with longitudinal undulated lines, the base transversely striated, near the spheric a brown band, the spheric itself spotted with brown.

Cingulum. Shell conic, yellowish, with a single elevated belt in the middle; spheric acute. Gmel.

Inhabits the Friendly Isles.

* * Section Pyriformis, &c. Pyriform with a rounded base, the cylinder half long again as the spheric.

Princept. Shell yellow, with purplish-brown longitudinal ramose lines. Linn.

Length of this shell about two inches and a half; the spheric is obtuse and finely striated transversely; the body marked with two white bands which have few brown spots, the rest of the shell spotted with chestnut. Inhabits the Indies.

Amnikalis. Shell with rough punctures at the base. Linn.

The varieties of this species, according to the character assigned it by Linneus, are numerous beyond example in any other shell, amounting to nearly forty distinct kinds, independently of a much greater number not hitherto well defined. Among the principal varieties the following are most interesting.

Laurius, faciis nullis, &c. Without bands, figured by Martini.

Americanus, with irregular bands, and admitting of several varieties, as those having the shell brown, and clouded or spotted with white. Shell reticulated and clouded with chestnut; white, spotted, dotted, and clouded with brown; white, having the bands marked with orange lines. Another strong variety anglicus, figured in the work of Gaullier, is of a red colour marked with numerous punctured white belts, and has the spheric spotted with brown. The variety coronatus, described by Argenville, is distinguished by a belt of reddish dots, and transverse elevated lines, and is sometimes marked with a yellow band in the middle, and numerous punctured belts; or sometimes brown with a white band, and an oblique row of whitish spots. Regius has two bands, which are generally of an orange colour with darker lines, the interfices white; shell with orange dots and undulated spots. Martini figures a variety of this kind, the shell of which is white with waved brown spots, and the bands varied white and brown; another has the bands yellowish with trifarious brown lines, and the shell white fringed with brown; and a third variety has the shell clouded white and brown, and the bands of a brown colour. In ordinarius the shell is tectaceous spotted with white; the bands white, and somewhat reticulated with an articulated belt in the middle. Guineensis has the shell of a straw colour, the middle band marked with angulated lines in a very beautiful manner. The shell of the variety farinaceus is of a bay colour with numerous dotted belts, the bands spotted and the lower one dotted with brown and white. This kind includes several inferior varieties. The variety fuminus has the shell of a ferruginous colour with scattered white spots, and is marked with yellow bands, very finely reticulated; it varies in the number of the regular bands. Occidentalis is another strong variety; the shell tectaceous spotted with white, and an articulated belt; bands yellow and reticulated. The coat and principal variety of the conus princeps is the cedo nulli, a shell found in the South Seas in amazing variety, some kinds of which are however extremely beautiful and rare, and in high esteem with amateurs. The geographical cedo-nulli is a fine and valuable kind, the prevailing colour of which is white, marbled with orange in a map-like manner. Another kind, called the "king of the south," (Rei du Sud, Argenv.) is of a fine deep golden orange with a white belt, and several distinct circles composed of clear white spots, three of which circles are disposed between the belt and the spheric. Before the revolution in France there were three specimens of this kind known in the cabinets of Paris; one in that of Madame la Presidente de Banderi, another in that of the king, and the third, superior in perfection to either, in the possession of M. le Comte de la Tour d'Auvergne, which last was obtained from the Isle of France, and was known by the title of Le Cedo-nulli aux iles. But the banded cedo-nulli bears the highest value. This shell, called by the French cedo-nulli a bande, or by some more emphatically La reine du midi, is better known in England by the name of Lyomet's cedo-nulli; it was formerly treasurer in the cabinet of that distinguished amateur, and esteemed at a considerable price, the sum of one hundred pounds sterling being actually refused by its possessor, who was nevertheless disposed to part with it at a fair valuation. Lyomet was an ingenious naturalist resident at the Hague, and, according to popular report, obtained this shell from the cabinet of M. de la Faille, auditor of finances to the states general of Holland, at the death of that eminent collector.

A particular account of this curious shell is given by Argenville, who pronounces it unique; this author describes it from a drawing made under the immediate inspection of Lyomet, the original of which we have seen, and are satisfied in the accuracy of his description. The shell from this drawing appears to be very elegant; its size is about that of the other varieties of the cedo-nulli, which vary from an inch and a half to an inch and three quarters in length, and measure rather more than three quarters of an inch in the wide part. The colour is yellow, divided by four distinct bands of marbled white, the one of which crosses the middle of the shell, and another next the base of the spheric, are the broadest and most beautifully variegated; the spheric itself is fuscated longitudinally. At the first glance the yellow appears two principal bands of pretty considerable breadth, one above and the other below the band of marbled white which encircles the middle of the shell. The two lateral mentioned yellow bands are better with four equi-distant transverse lines of brilliant light points, which give the shell in this part a slightly feabrous appearance.

It is only in conformity with popular report, that the shell of Lyomet, as being intimated, is preferred to be the celebrated cedo-nulli of La Faille's cabinet, the truth of which has been contested by respectable authority. Favanne thinks
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It species is not the same, and Germain positively declares it is not. The individual shell of so much repute in the collection of La Falle, according to the latter writers, was sold at the same time, with the other articles, at the Hague, about the year 1728, and was bought by a dealer for the king of Portugal’s cabinet, at a price exceeding a thousand French livres. Hence it is imagined that Lyonet procured his famous shell from some other source. If we are not mistaken in our information, there were originally two shells of this same kind in the cabinet of La Falle, which presented Lyonet with one of them, and which, if true, at once re- solves the mystery. The fate of Lyonet’s shell is not exactly known; it is believed, at present, to enrich one of the Parian museums.

We shall lastly mention a variety of the cedo-nulli, formerly in the rich cabinet of Madame de Bandevillle, called le cedo-nulli marbre, from the beautiful variegated or marble-like appearance of its colours, which were blueish and violet on a ground of white. The shell was also embossed with three yellowish zones, and becket with a number of little roundish granulations of a white colour encircled with red. ViCARIUS. Shell tallceous, spotted with white, with four yellow immaculate bands, the second divided angularly. Gmel. Archibaldisse secundus, Argenv.

Said to inhabit the southern ocean. SEMATOR. Shell conic, smooth, glabrous with obtuse sculptured whorls. Martin.

Native place unknown; the shell is yellow spotted with white, and marked with very numerous tranverse fibriz, composed of white and brown dots. NOBILIS. Shell sub-cylindrical, smooth and glabrous. Linn. Tigris lutea, Argenv.

This species is finely polished, of a yellow or brown colour, occasionally shaded with olivaceous, spotted with white, and marked with very minutely punctured tranverse fibriz. GENUANUS. Shell with linear belts articulated with white and brown. Linn. Genus-fiche toot, Rumpf. Janam, Adanf.

Found on the shores of Guinea. The shell is red, with bands alternately tesselated with brown and red. The “A la papallonis” of Argenville, called also by English collectors the butterfly cone, is considered as a variety of this species. GLYCINUS. Shell emarginate at the base, and frriated; spire unarmed, with the whorls contiguous. Linn. Boterviege van Boer. Rumpf.

A native of India and Africa. The shell is varied with brown, chefnet, and red spots, sometimes placed in rows, and the spire, which is tranversely frriated, varies in being more or less convex, and marked with spots, which are sometimes square. MONACHUS. Shell gibbose, clouded with blueish brown, acute, and frriated at the base. Linn. Capacinus f. anicula, Rumpf.

Supposed to be a native of India. Shell sometimes marked with dots disposed in rows. MINIMUS. Shell greyish, surronded with oblong dots. Linn.

Delineated in the works of Martini and Knorr; the native country unknown. RUSTICUS. Shell ovate, rugged, and frriated at the base; the spire conico-convex. Linn.

There are two varieties of this species, one of which, va-luta cinerea of Rumpfius, is without any band, the other has a band, clouded with whiffin, and is varied with blackish lines and dots. This shell inhabits Africa.

MERCATOR. Shell ovate and white, with reticulate yellow bands. Linn. Tilit, Adans.

Inhabits the shores of Africa. Shell of moderate size, sometimes yellowish, with brown or tawny bands. BUTELINUS. Shell slightly emarginate at the base, and frriated; the spire flatish and mucronated. Linn.

This is a native of India; the shell is rather large, and admits of several varieties, being either yellow or ochraceous, with tesselated spotted bands, and intermediate lines of yellow or brown; white, with three rows of violet characters; or white frissed, spotted and dotted with brown. The Conus Melville of Martini is esteemed a variety of this species. FIGULINUS. Shell slightly emarginated at the base, and frriated; spire acuminated, with flatish whors. Linn. Vo- luta jofa, Rumpf.

Length about three inches; brown, ferruginous, or yellow, and rarely olive, with darker lines; within generally whitish. A variety described by Knorr is of a more elongated form, the colour orange, with darker lines, and two yellowish bands; the spire reddish, spotted with black. Inhabits India.


Native of the same country as the last. Shell rather small, and sometimes reddish, with parallelomeric spots, which are often chefnet. There are several varieties of this species. It is known by the name of the Hebrew character cone, among English collectors. STERCUS MUSCARUM. Shell emarginate at the base, and frriated, whors of the spire canaliculated. Linn. Fo- luta arcuata, Rumpf.

Inhabits Asia. This shell is of a long and narrow form, and white colour, with flattered black or red spots, which are sometimes united into bands; whors of the spire obtuse, and in some of its varieties tuberculated.

VARIUS. Shell elongated and muricate, with the spire coronated and acute. Linn.

A native of the Indian ocean. The shell is white, clouded with brown or yellow, and granulated frits disposed over the whole surface. ACHATINUS. Shell elongated, very finely frissed tranversely, and variously clouded and spotted with white; spire short, spotted with brown, and red at the tip. Gmel.

Several varieties of this shell are described by Seba and Chemnitz; the species is a native of the American ocean. RADIANUS. Shell radiated and fasciated with white. Gmel.

Native country unknown; the shell is brown, pale yellow, or cinereous, and is figured by Martini. LEONINUS. Shell with pale yellow or chefnet spots; commonly marked tranversely with white or yellow bands, composed of grains or spots. Linn.

Found in the Indian ocean; and is a species comprehending a great number of varieties, as may be seen by the works of Knorr, Martini, Seba, Chemnitz; and others; about fourteen distinct varieties are ascertained.

JASPIDEUS. Shell light olivse, with multifarious white dots, and an oblique band. Martini.

This is a shell of an oblong form, and small size. The native place is uncertain.

NEBULOSUS. Shell brown clouded with blue, and white spots. Gmel. Bonann, &c. A doubtful species; the country unknown.

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Coffee. Shell short, brown, with two white bands; that nearest the spire spotted with brown. Martini.

Shell of moderate size; country undetermined.

Amadeus. Shell pale brown, with a broad band, and articulated belts above and beneath; spire acute, crowned with tubercles, and very finely reticulated transversely. Argenv. Zonamorph. Country unknown; shell varies in being more or less reticulated.

Fulminus. Spire acute, and with the pillar-lip spotted with chevron; shell fluted longitudinally with chevrons; base acute, and reticulated obliquely. Martini.

Arsenoides. Shell reticulated with chevrons; with two or three darker bands; spire coronated and acute. Argenv. Zonamorph. Described as an extremely rare shell, and probably not of this tube. Its native place is unknown.

Costatus. Shell brown, with a white band, undulated with reddish, with thick and broad flutes; spire nodulous, with a granulated band. Gmel. Country unknown.

Leucostictus. Shell white, clotted, fringed, and spotted with browns, and marked with numerous rows of white and brown dots; spire crowned with tubercles. Gmel.

Inhabits the Indian ocean; and has the spire of the shell sometimes acute.

Citrus. Shell citron colour, with black lines interrupted beneath; spire crowned with tubercles, and with the base white. Gmel. Inhabits the Caraccas.

Insularis. Shell white, with chevron clouds, spots, and dots; and spire acute. Gmel. Country unknown.

Coronatns. Shell with alternate articulate belts, and teffellated spots; spire crowned with tubercles. Gmel.

A small and extremely variable species, and which is often times marked with a white band. Its country is unknown.

Punctatus. Shell with two yellowish-brown bands, and numerous lines of dots; spire varied with yellow dots and lines. Knorr.

Zeylanicus. Shell snowy, with rosy and brown clouds, and numerous articulated belts, varied with white and chevron; spire pointed. Martini. The base of this species is grooved obliquely.

Solidus. Shell conic, thick and transversely fluted, crowded with white and brown; with a broad white band, and pyramidal spire; the whorls canaliculated. Chemn.*** Section elongata, &c. Elongated and rounded at the base; the cylinder twice the length of the spire.

Clavis. Shell with convex smooth flutes; the base blueish. Gmel. An extremely rare species, found in the Indian Ocean. The shell is long, yellow, with white spots, and two deeper bands spotted with white; the spire spotted, and gradually tapering to an obtuse point.

Nussatella. Shell somewhat cylindrical, red, not crowned with tubercles, rough, with tuberculated flutes. Gmel.

Teredolum granulatum. Rumph. This is a scarce species, and inhabits the island Nussatello in Asia. The shell is pale, clotted, and spotted with red, or rarely entirely white; with yellowish-brown, granulated, transversely fluted; and the spire ending in an obtuse point.

Terebellum. Shell white, fluted with blue, tuberculated, with annulated flutes, and yellow bands. Gmel. Inhabits the Indian seas.


Coccineus. Shell red, with transversely lines dotted with black, with a white band and spire, spotted with red. Gmel., Knorr, &c.

Cassius. Shell somewhat cylindrical, with annulated ribs, red, with darker clouds, and bars of white; spire spotted. Gmel.

Figured by Lillie and Knorr, and is supposed to be a variety only of C. granulatus. Its country is unknown.

Granulatus. Shell rough, unarmed; flutes smooth and grooved. Linn. Voluta granulata, Rumph. Inhabits the African ocean. Shell red, with large fulcra; flutes reticulated with white and purple linear dots.

Oxymyclus. Shell sub-cylindrical, yellow; the base obliquely fluted with a contiguous white band; spire pointed, and marked with fibril spotted. Gmel.

The native country is unknown. A variety of it is found of a chevron colour, varied with decussating flutes, dotted with red.

Laevis. Shell rufous, with fulvous spots, and transverse flutes; spire spotted with yellow; base obliquely fluted. Gmel., Valent. &c.

Affinis. Shell blueish-white, with four fulvous linear bands, and intermediate dull purple dots or marks. Martini.

Violaceus. Shell white, clotted and banded with violet; rays pale brown. Martini.

Polyzonias. Shell white within; externally yellowish-brown, and rough, with very fine granulated lines; white band at the spire, denticulated beneath; another at the base paler, and numerous fibrous bands. Born.

Bifasciatus. Shell white, with angular chevron lines, and two orange bands; spire prominent; base surrounded with orange lines, and intermediate teffellated spots. Born.

Nives. Shell conical and snowy; spire prominent and coronated; aperture large. Born.

Arausius. Shell not crowned, smooth, with whitish bands; whorls grooved at the tips. Gmel. Oranjen admiral, Rumph. A beautiful and rare species found in India. The colour is in general whitish, with two or three orange bands, and white lines, teffellated with brown spots; spire with oblong spots of red, white, and brown.

Morus. Shell sub-cylindrical, with longitudinal bands, dotted with white. Linn. Voluta macula, Rumph. A native of India. Shell white, with dotted lines, and oblong, chevron, yellow, and brown spots; spire acute and spotted.

Striatus. Shell ovate-oblung, gibbous, clotted, with very fine parallel brown flutes. Linn. Voluta tigrina, Rumph. Melur, Adans. Common on the coast of Africa. Shell four inches long, snowy, with sometimes reddish or yellowish flutes; the base edge margined and transversely fluted.

Textile. Shell reticulated, with yellow veins, and spotted with yellow and brown. Linn. Panus aureus, Argenv. Lomon, Adans. A native of Asia. Chemnitz describes a variety of this species, of a white colour, with three orange bands; and another of a brown colour, with two darker bands.

Aulicus. Shell white, with brown reticulated veins, and interrupted longitudinal bands. Linn. Nigella, Argenv. Nearly allied to the former, and supposed by some to be a variety; it likewise inhabits Asia, and admits of many varieties, several of which are figured by Martini.

Tomax. Shell smooth, white, with bay characters, and
The word *nervus* signified a tendon, as well as an elongation of the brain and spinal marrow, which is now exclusively called a nerve; hence the Roman name for convulsions, which signifies dislocation of the tendons. And accordingly, those slighter convulsive motions of the muscles of the arms, which occur in fever, and occasion a playing of the tendons under the finger of a person, feeling the pulse, we now call a fluting of the tendons, *fulguratio tendinis*. But those different forms of spasms and convulsion are frequently mixed, or pass into each other; and similar causes, affecting the brain and nervous system, produce both the one and the other.

It was vain to attempt to give an explanation of the nature or proximate cause of convulsive motions; since we are ignorant of the nature of the nervous power, or of that medium by which the muscles are connected with the common fenestrum, and the volition of the mind is communicated to the muscles. We must be content with the observation of facts: the minute operations of nature are inferrible. The mechanical physicians had, indeed, no difficulty in accounting for the morbid, as well as the healthy operations of the nervous system: their imagination furnished them with a cause for every effect. Thus they supposed, like the natural philosophers, the existence of a subtle, aerial fluid, the motions and vibrations of which produced all the effects which they observed. But further supposition, different phlogiologists explained the mode in which this gratuitous fluid operated. Borri fancied that there might be oblong valves in the fibres of the nerves and muscles, which were rendered spherical by the force of the nervous fluid, and therefore shorter. Others imagined that the influence of the nervous fluid separated the parallel fibres of the muscles from each other, and thus shortened the length of the whole. But it were useless to enumerate the various futile hypotheses, which originated in an erroneous philosophy. All that we know on this subject is, that some of the muscles of the body contract, in a state of health, by the will of the mind, as those of the trunk and extremities, others, apparently without the intervention of an act of volition, although subject in a great measure to the will, in consequence of a local sensation; as the diaphragm, and the other muscles of inspiration; the eyelids, in *scleritis*, and others, again, are excited to contraction, together independently of the will, by an irritation so obfuscated, as to excite no perception in the mind; as the heart, which continues its unperceived motions, in consequence of the irritation or stimulus of the discharging blood, which is returned into its cavities by the vena. The contractions, produced by one or other of these causes, are regular in force and velocity, according to the degree of excitement; and are always followed by a state of relaxation; and are not repeated, except when the will or the irritations again operate. In the morbid or convulsive state, the contractions of the muscles, ordinarily depending on the will, are excited without the concurrence of the will, or in a way contrary to what the will intends; and in the other instances, they are excited disproportionate to the action of the usual and natural irritations. Hence it may be concluded, without any gratuitous hypothesis, that when these convulsive motions are excited, independent of, or in opposition to, the will, some change in the condition of the seat of volition, the brain, and its elongation, the nerves, has occurred; and, if the convulsions are partial, that some great local irritation has been applied.

Now, although it be confessed that the actual condition of the brain, which occasions convulsions of the moving fibres, be unknown, as well as its condition and mode of operation...
operation in health; yet certain conditions of the body, in general, have been observed to be connected with the occurrence of convulsions, which lead to a knowledge of the state of the brain in the groans, and serve as valuable guides in our practice in these diseases.

Convulsions have been chiefly observed to occur, when the body is in a state of repletion, insomnian, or great irritation. It may seem inexplicable, that the two opposite conditions of repletion and insomnian should give rise to similar morbid appearances; but the knowledge of the fact, which is established beyond a doubt, is sufficient for our practical purposes. We shall illustrate the operation of each of these states in producing convulsive diseases.

1. Repletion of the system at large, or of the brain in particular, is a state in which convulsions frequently occur. Numerous instances are on record, in which epilepsies have occurred, where a general pellagic state of the constitution was present. Epileptic convulsions have sometimes succeeded apoplexy, which is known to originate in over-turgescence of the brain. Every occasional fulness, or unusual impulse of the blood into the veins of the brain, such as from a fit of anger, the heat of the sun, or of a warm chamber, violent exercise, a surfeit, or a fit of drunkenness, are frequently the immediate exciting causes of convulsions. (Cullen. Puet. Lines, § 1296.) Hence also, in inflammatory fevers, as in the eruptive fever of the small-pox, where the blood is carried to the brain more abundantly, and with greater impetus than in health, convulsions are frequently produced; especially where the circulation is hurried by a hot regimen. The supposition of accustomed discharges, or the omission of habitual evacuations, have also been the occasion of convulsive affections, in consequence of the general plethora which ensues. But the most marked and striking influence of convulsions, induced by repletion, occurs in the puerperal state. They generally come on in the early state of labour, and are attended with fulness and dilatation of the features, and other obvious marks of determination of blood to the head; they speedily cease when the delivery is accomplished, if they do not prove fatal before that takes place; and copious blood-letting is the only effectual remedy. In all these instances, indeed, which have just been mentioned, the good effects of evacuating medicines, of a spare diet, and cool regimen, in removing the diseased state; and the bad consequences which have ensued, under the employment of an opposite treatment, point out repletion as the cause of the mischief. This is also, still more clearly ascertained from the diffusion of those, who have died in consequence of convulsions, occurring under such circumstances; marks of a conjunction in the brain having been generally observed. See Ehepsys.

2. Insomnia is a frequent cause of convulsions. It has been observed from the earliest ages, that convulsions invariably proceed death, when it is occasioned by loss of blood; and the fact is daily exemplified in slaughter-houses, when animals are killed by opening the large blood vessels. Hippocrates states, in his Aphorisms, Sect. v. Aph. 7, that convulsions, or hicouges (which is, in fact, a convulsion of the diaphragm), succeeding a great hemorrhage, are dangerous, and he repeats the observation in Sect. vii. Aph. 9. From this cause convulsions sometimes occur in the puerperal state, where great hemorrhage from the uterus has occurred. But in such instances, the countenance, far from being flushed, with a fulness of the features, is pallid, and the features are sharp and sunk; there are cold sweats, and other symptoms of exhaustion, which mark the diminution between this form of convulsive disorder, and the proper puerperal convulsions, mentioned under the former head. In these convulsions from inanition, the contrary remedies, cordials, and powerful stimulants, largely and frequently administered, afford the only means of saving life. "Si fluxui mulchcri, fays Hippocrates, "animi diliquum et convululo supervenient, malum." Sect. v. Aph. 65. Other great evacuations also excite convulsions; such as great discharges from the bowels by purging. In the early periods of the history of medicine, when the limited catalogue of the materia medica debared the physician from the choice of expedites, according to the circumstances of the case, it would appear that this unfortunate consequnce of a violent purgative was by no means uncommon, since we find it often alluded to by Hippocrates. "Convulsion from Hel- lebore is fatal." Sect. v. Aph. 1, and again, he observes, in Sect. vii. Aph. 25; "Convulsions from a purgare are fatal." Happily the numerous articles of mild operation, which we now possess, render such an occurrence unknown to the physicians of modern times. Convulsions have been, likewise, observed to occur, in consequence of exhaustion of the animal powers, by other means; such as by excessive fatigue; by want of food; by long continued and severe mental exertion; &c. The cure of convulsions, occasioned by inanition, from any of the causes just stated, will obviously consist, in the use of such remedies as will put a stop to the evacuations; in the administration of cordials and stimulants, to counteract the prevalent failure of the vital powers; and in the employment of moderate quantities of a cordial and nutritious aliment, to restore the masts of circulating fluids, and the strength of the body. Rest, food, and relaxation, will be the remedies required in the last-mentioned instances.

But 3, Irritation, corporeal and mental, is the most fruitful source of convulsions. The degree of corporeal irritation, which is sufficient to occasion convulsions, varies greatly; not only according to the peculiarities of age, and constitution, but according to the part to which it is applied, and sometimes according to circumstances, which are not obvious. Sometimes the irritation amounts to severe agonizing pain; more commonly to a moderate degree of uneasiness; and frequently, it is such as to excite no perception: sometimes it is a titillation, or attended with feelings on the whole pleasurable. It may excite convulsions of the muscles in general, when applied to the brain itself; or to other parts of the body, as to the bowels, flomach, kidneys, and other viscera; to the gums, the skin, and the organs of sense.

Convulsions are among the most common symptoms of irritation of the brain itself, either from external or internal causes. Thus they are frequently excited by blows, or wounds, on the head; by fractures of the cranium when a portion of the bone is depressed, or fragments of it are driven in upon the membranes of the brain; by effusions of blood, lymph, serum, and pus, in the vitreous or on the surface; by Bony excrescences from the internal surfaces of the skull; or by tumours, thickening, or abscusses, in the membranes or submucous of the brain. Mechanical injuries of the nerves, which are elongations of the brain, have also given rise to general convulsions.

Irritations of parts distant from the seat of sensation and voluntary motion, produce the same effects. Thus wounds of the skin, and of the muscles and tendons in the extremities, occasion the most painful and fatal of all convulsive affections, the tetanus: and it is remarkable, that it is not a large discharging wound, which in general excites this disease; but a superficial injury, or a wound just healing, when the irritation would seem to be less powerful. In this disease, all the antagonist muscles of the body are feixed
feized at once with a convulsive action, so that the trunk and limbs become perfectly rigid, and the jaw is locked. Sometimes the muscles of the back overpower their antagonists, the body is then bent backwards like a bow, and the patient rears on the head and the heels; this state is termed spilhstoton. Sometimes, on the contrary, the action of the abdominal muscles is most powerful, and the body is then bent forwards in a similar manner; this condition is called emprophstonos. (See those articles.)

Several instances of convulsions are related by authors, in which flowers, of sharp and irregular figures, were found after death in the urinary bladder, or thickening in the pelvis of the kidney, or in the course of the ureters. In others, convulsions, which had occurred in consequence of ch ris irri-

irritations, ceased upon the discharge of calculi with the urine.

Irritations in the alimentary canal are very frequently the cause of general convulsions, more especially in young children. In children, indeed, it has been said that convulsions are not to be considered so much a disease themselves, as the indication of disease in the bowels, or other parts. (Med. Obs. and Inq. vol. iii. p. 292.) The presence of worms, of undigested aliment, of morbid secretions, or even a retention of the natural faeca, by contumacy, are common causes of convulsions at an early age. The retention of the meconium is said to occasion the locked jaw of new-born infants, in warm climates, the trifurmis nasilenium of authors. Some children, in fact, are so irritable during the first five years of their life, as to be thrown into convulsions by very slight causes of irritation; a disposition which is only removed, as the constitution becomes strengthened by age. The irritation of the rising teeth, when the gums do not readily yield to their pressure, has been frequently observed to excite convulsions in children, which were removed on the appearance of the teeth above the gum, or by the division of the gum by means of a lancet. For it is remarkable, that the greater temporary irritation of a cutting instrument is borne, without any convulsion being excited, while the constant uneasiness of the irritating tooth had frequently been productive of the convulsions. In the same way, when convulsions are occasioned by the irritation of worms, or of undigested food, in the intestines, the additional irritation of a cathartic medicine shall not increase the convulsive affection, which ceases, when its operation is over. In the treatment of the convulsions of children, where the irritating cause is obvious, but cannot be instantly removed, the convulsive motions may be frequently suspended in the mean time, by immersion in the warm bath, by warm fomentations, or by the use of a small dose of an opiate, proportioned to the age and strength of the child, and the violence of the disease. But such measures are only palliative; the radical cure will depend upon the removal of the cause of irritation.

In situations of peculiar irritability, certain irritations of the organs of sense have given rise to convulsions. Thus in regard to the sense of touch, a cafe is related by Van Swieten in which titillation of the fleshes of the feet of a young girl, excited convulsions: he also mentions instances of the same effects being produced by a sudden exposure to great light, or great noise; a boy was thrown into convulsions by the unexpected sound of trumpets. Certain powerful odours have occasioned convulsive motions when applied to the organ of smell. It seems to have been a custom formerly, says the author just mentioned, for those who purchased scents, to try them with the smell of the jet-flame, in order to discover whether they were subject to the epilepsy. Arctatus has remark-
ed that by this odour the epileptic paroxygm was excited; and Apulus, who was accused of magic, in pleading his own cause, made the following observation. "But if I wanted to throw down an epileptic person in a fit, what need could there be for a charm to do it? seeing the jet-flame, when it is burnt, as I read in physical authors, inflames this disease itself; and by the smell of it they commonly try the health of the slaves in the markets." Van Swieten. Com. § 107.

Many poisons, especially the vegetable poisons, by their action on the nervous system, when taken into the stomach, produce the most terrible convulsions. The chinin a quantity, or water-hemlock, is said by Wepfer to have been eaten by several children, who mutilated the roots for parching; they were all seized with severe convulsions, which proved fatal to two of them; the rest having been made to vomit, and eject the poison from the stomach, speedily recovered. Thus vegetable narcotics, even opium itself in an overdose, have produced similar effects.

Mental irritations, or violent emotions of the mind, frequently give rise to general convulsions, especially in females, and those of hysterical habits. The influence of the mind on the body is too obvious to require much illustration. The actions of the heart, the circulation of the blood, and the functions of the visceras, are variously modified by emotions of the mind, and no organ is more fully affected by them in its functions than the brain itself. Different emotions seem to affect the system in different and even opposite ways; some routing it to actions of unusual vigour, quickening the circulation, and strengthening the powers of volition; others, again, paralyzing its strength, and giving languor to all its motions. Hence the poisons have been divided into two classes, exciting, and depressing poisons. Now these opposite poisons, which seem to produce the same effects as repetition on the one hand, and inanition on the other, alike excite convulsions of the body. This may be exemplified in the leading poisons, anger, and fear, both of which are occasionally the causes of convulsions. In a man under the influence of the excitement of anger, the heart beats with greater force and celerity; the pulse is fuller, stronger, and swifter; every part swells and grows broader; a greater heat over- spreads the whole body; almost every muscle is extended; the eyes are prominent from their sockets, and look fierce and sparkling; being charged with blood. These symptoms imply a corresponding fulness and force in the vessels of the brain, which, when carried to a certain extent, induce convulsions. On the contrary, a man under the des- pression of fear, grows pale and cold, and shrinks in every part of the body; his pulse is quick, but small and unequal; the heart palpitates; the lungs are oppressed, and sobs and sighings follow; his strength fails him; his whole body trembles, and he is fearfully able to articulate. These phenomena shew a depression, a collapse of the powers of life, resembling that which occurs from inanition, and, like that, producing sometimes a general convulsion. See Swieten Com. in § 104. Many examples might be quoted of the convulsive attacks occasioned by these passions, and especially by fear. We shall mention one instance from the latter cause; for the sake of illustrating the effects of another principle, the affection of ideas, in re-excitign convulsions, thus originally produced. A boy was so much frightened by a large dog jumping upon him, that he precociously fell down attacked with epileptic convulsions: afterwards, the paroxygm was brought on by the sight of any large dog, or even by hearing him bark. This effect of affection is frequently observed in a minor degree; thus, any substance used as a vehicle for an enetic medicine will, in some per-
CONVULSIONS.

from, when taken alone, excite sickness for some time afterwards. Van Swieten affirms that he has seen a person, who, after having frequently taken a nauseous purging draught, upon seeing the cup out of which he took it, not only shuddered, and became squeezing, but likewise had several ftools; thus the sole idea of a nauseous remedy being renewed, toppled the place of a purge, and disturbed the whole body. Comment, in § 1075.

There is another prolific source of convulsive affections, which must not be overlooked in determining the mental causes of these formidable disorders; namely, the principle of imitation. This principle sometimes operates alone; sometimes its operation is combined with an impression of fear: and sometimes with various other strong impressions made on the imagination. This involuntary imitation is the source of almost all that is learnt in infancy; and its importance in the formation of character, has been well illustrated by Dr. Aikin. See Athenæum, No. xin. Jan. 1828. In after-life we all experience its operation, in the irresistible propensities to yawn, to laugh, to weep, with others. Hence much of the effect of theatrical representations, especially crowded audiences: hence also the facility with which a panic spreads among an army of soldiers; and hence the power, on the one hand, and the cowardice, on the other, of a mob. This tendency to receive impressions and emotions involuntarily from others, and more especially, when they are accompanied with corporal motions, and the tendency to repeat those motions involuntarily ourselves, are principles rooted in the human constitution; and upon them much of the history of insurrections, and also of the propagation of religious enthusiasm, depends, as well as the minor circumstances of convulsive diseases.

Every physician has witnessed the effect of the sight of an hysterical convulsion, on other women predisposed to that disease. It is not uncommon to find several women thus convulsed, one after the other, from this cause. We have even known the scream of one woman, feized with an hysterical paroxysm, excite convulsions in another, who heard it in a different room. The well-known cases which occurred in the orphan-hospital at Haerlem, under the care of Dr. Boerhaave, shew the extensive operation of this principle, and also that these imitative attacks may be effectually prevented, by exciting a strong counter-impression in the mind. That celebrated physician, finding that epileptic convulsions, which had occurred in one boy, attacked, one after another, all the boys who witnessed the paroxysms, by threats of inflicting severe bodily pain on the flirt who should be attacked with these fits, succeeded in preventing the recurrence of the epilepsy.

This principle is still farther exemplified in the epidemic convulsions which have occurred at different times in different countries. In several districts of Scotland such epidemics have frequently appeared. The Rev. W. Archibald, parochial clergyman of Unit, the most northerly of the Shetlands, gives the following account of epidemic convulsions which occurred in his parish, "There is a shocking distemper, which has of late years prevailed pretty much, especially among young women, and was hardly known thirty or forty years ago. About that period only one person was subject to it. The inha masts give it the name of convulsion fits; and indeed, in appearance, it something resembles an epilepsy. In its first rise, it began with a palpitation of the heart, of which they complained for a considerable time; it at length produced swooning fits, in which people feized with it would lie motionless upwards of an hour. At length, as the distemper gathered strength, when any violent passion feized, or on a sudden surprise, they would all at once fall down, toss their arms about, wring their bodies into so many odd shapes, crying out all the while most dolorously, throwing their heads about from side to side, with their eyes fixed and staring. At first this distemper obtained in a private way with one female, but being foretold in a public place at church, the distemper was communicated to others, but whether by the influence of fear or sympathy is not easy to determine. However this was, our public assemblies, especially at church, became greatly disturbed with their outcries. This distemper always prevails most violently during the summer-time, in which season, for many years, we have hardly one Sabbath free." The Rev. Mr. M., giving an account of a similar epidemic in his parish of Delting, says, "It most commonly attacks them when the church is crowded, and often interrupts the service in this and many other churches in the country. On a sacramental occasion, fifty or sixty are sometimes carried out of the church, and laid in the church yard, where they struggle and roar with all their strength for five or ten minutes, and then rise up without recollecting a single circumstance that happened to them." Stat. Acc. Scotland, vol. i. p. 585. See Edin. Med. and Surg. Journ. No. xi. In another parish, Northmaven, a cure is said to have been effected, as in the hospital at Haerlem, by a strong counter-impression upon the mind. "The cure is attributed to a rough fellow of a Kirk-fleer, who told a woman in that flate, with whom he had been frequently tempted, into a ditch of water. She was never known to have the disease afterwards, and others dreaded the like treatment." Stat. Acc. vol. xii. p. 565.

A similar prevalence of convulsive affections, which occurred on the estates of the earl of Uxbridge and Holland Gibb, &c. in the isle of Anglorska, was checked by the judicious precautions recommended by Dr. Haygarth, from a knowledge of the principle which we are illustrating. He advised that all girls and young women should be prevented from any communication with persons affected with those convulsions, and that those who were ill should be kept separated as much as possible. See Treatise on the Imagination as a Cause and as a Cure of the Disorders of the Body, Bath, 1780.

This principle of imitation, especially when the imagination is strongly excited by images of terror or superstition, has been referred to by designing men for the purposes of impressing on the public credulity, with a view to their own profit. Upon this was founded the success of Melmer, De Mainaudne, and other empirics, in the disgraceful practice of animal magnetism, as it was called; the nature and imposition of which were fully detected and exposed by the commissions appointed by the French king for the purpose of investigation. The celebrated Dr. Franklin was one of those commissioners, and his report has fully developed the mystery of the magnetisers. By the aid of circumstances, of situation, g. com. &c. and by their own enthusiasm, they gradually worked on the minds of their company, who were already predisposed to receive any impression, for they did not operate on single individuals, until they brought them, mind and body, to a state of extreme irritability; then, alluming extravagant gestures and violent motions, the speculators were led to an involuntary imitation, and as soon as one of the party showed any symptoms of violent or convulsive exertion, the rest were speedily affected in the same way. This was called the crisis, and the operation was considered as complete. Dr. Franklin shewed, that, without the aid of local circumstances, of numbers, &c. the powers of the magnetiser amounted to nothing.

It were unnecessary to pursue this illustration farther, or it
might be shown that the propagation of religious enthusiasm and fanaticism is effected by the same means; is frequently connected with convulsive motions, or frantic gestures, amounting nearly to convulsions; whence we find jumpers, whippers, and originally quakers, as the distinguishing appellations of sects; and that it depends much upon the contagion of the principle of imitation among crowded assemblies, for its success.

But to return to the subject of convulsions, more strictly within the sphere of pathology. We have mentioned the indications and means of cure, in most cases, as they occurred. In convulsions, which come under the two first heads, as arising from relaxation and inattention, it must be obvious, that an exculcating system must be adopted, and the contrariety of system of support and nutrition, in the second.

The individual expedients to be adopted, on either of these occasions, will readily suggest themselves, according to the peculiar circumstances of the case. In convulsions, which arise from irritation, the discovery and removal of the irritating cause, where it is of a nature to be removed, is not less obvious requisite for the cure. But in the mean time, before any of these intentions can be fulfilled, the violence of the convulsive motions may continue, so as to injure the body, or destroy life. It is desirable, therefore, that some palliative measures should be adopted; and these are chiefly the use of medicines of the antipalpmonic class, such as opium, maff, ether, and other powerful stimulants; the use of the warm bath; or of the opposite expedient, the cold bath. Of these remedies, with the exception of the last, little is required to be said; the efficacy of the former being well understood. But as the cold bath is a powerful expedient, and can be often resorted to more speedily than the others, it may be necessary to mention the nature of its powers.

Dr. Currie, from an experience of eight years, afferts that the cold bath is very efficacious in removing the convulsions of children, whether the disorder originates in worms or other causes; that it seldom fails in stopping the paroxysms, at least for some time, thereby giving an opportunity of employing the means fitted to remove the particular irritation. Several cases of tetanus have also been cured by the cold bath of late years. In the convulsions of hysteria, the cold bath, or indeed a plentiful affusion of cold water, is an almost infallible remedy. Dr. Currie observes, that the efficacy of the cold bath in convulsive disorders is the greatest, when it is employed during the precence of the convulsion; and also that it is of greater efficacy in general convulsive affections, than in those which are only partial. In chojen functi Vit.i, for instance, it has been frequently tried without any success. See Currie, Reports on Water, &c. Append. p. 13. ffeg.

Where the source of irritation is not discoverable, besides these palliative means, other medicines are commonly employed to give strength and vigour, and to leffen the irritability of the moving fibre, so as to render it less susceptible of being excited to extraordinary action. The various articles of tonic and corroborant medicine have been administered with this view, but most frequently, the metallic salts and oxides; as the sulphates of zinc, and iron, and copper; the oxide of zinc; and even the caufic nitrate of silver has been employed in small doses.

CONVULSIVE DISEASES, those diseases in which convulsions are the leading symptoms. See Convulsions. These diseases have received different appellations, and also require different methods of treatment, according to the varieties of their form. Some confiit of general convulsions of the whole muscular system, as tetanus, epilepsy, some forms of hysteria, &c.; others are distinguished by the con-

vulsions being confined to particular parts, as trismus, when the muscles of the jaw are affected with spasm; chorea, or St. Vitus' dance. Hiccough, and even cough, may be considered as partial convulsions. See these articles respectively.

CONVULSIVE AILMENTS. See Asthma.

CONWAY, in Geography, a river in North Wales, called by Ptolemy and Antoninus. Kynew, in the ancient British language, signifies the great river, from which are derived the words Conway and Conwy. This stream, considered one of the most in Europe, rises in the mountains of Pennine, north of Llyn Conway, and is navigable for small vessels to Llanrwst bridge; erected by Inigo Jones with a centre arch 60 feet wide (see Canal); but receiving many tributary streams in the course of 12 miles, it becomes sufficiently deep to bear ships of considerable bulk, and is nearly a mile in breadth at high water, but not more than 150 feet at low water, and eight feet deep, at the ferry opposite the town of Conway, beyond which it flows into the Irish Sea. The spring tides vary from 1.1 to 18 feet; consequently vessels of 400 tons burden may approach close to the town: nevertheless the shifting land-banks make the entrance of the port dangerous. The mya margaritifera of Linnaeus, or pearl mucle, made the river of importance previous to the Roman invasion. Such was its celebrity, that Saxonius acknowledged the pearl-fishery of the Conway to have been one of his inducements for undertaking the subjugation of Wales. According to Pliny, the mussels, called by the natives bregindlia, were fought for with avidity by the Romans, and the pearls found within them highly valued; in proof of which it is asserted, that Julius Caesar dedicated a brass-plate, set with British pearls, to Venus Genetrix, and placed it in her temple at Rome. A fine specimen from the Conway is said to have been presented to Catharine, comfort of Charles II., by sir Richard Wyne of Guedir; and it is further said, that it has since contributed to adorn the regal crown of England. Lady Newborough possesses a good collection of the Conway pearls, which she purchased of those who were fortunate enough to find them, as there is no regular fishery at present. The late sir Robert Vaughan had obtained a sufficient number to appear at court, with a button and loop to his hat, formed of these beautiful productions, about 28 years past.

CONWAY, or ABERCONWAY, an ancient town of Carnarvonshire, North Wales, is situated on the river Conway, near its confluence with the Irish Sea. This place does not appear to have acquired any confluence till the time of Hugh Lupus, earl of Chester, who fortified the mouth of the river about the year 1098; and it obtained more distinguished importance during the reign of Edward I., who enlarged the fortifications, and erected a very strong castle in 1284. The outline of this venerable and romantic place is triangular, and is still surrounded with embattled walls. These are erected in many places upon solid rocks, and are one mile and an half in circumference; they have four gates, and were defended by 24 ballins; in addition to which, two curtains projected into the river, where they terminated with watchtowers: but these and one of the former have fallen. Edward I. evinced great skill in continuing the defensive works of Conway, and particularly by erecting his fine pilla on the base of the triangle next the river, where nature had placed a vast perpendicular rock of slate. He thus protected England from the incursions of the Welsh, who were commanded by Llewelyn; and afforded himself and successees an impregnable post for collecting the means of invasion, when an opportunity offered for entering Wales with any prospect of success. By this castle he laid it in his power.
to occupy the neighbouring pasts of Penmaen-Mawr at pleasure, and by that means to cut off all communication with the interior of the principality: and yet this fortress had once nearly cost him his crown, in proceeding to it at the head of his army. On this occasion, Edward inequitably crossed the river Conway with a few attendants, and was separated from the town by the flowing of the tide. At this critical moment the Welsh attacked the castle; but although the monarch and his little band of soldiers were delirious of every refreshment, except honey and water, they had the bravery and address to refit their opponents, till the ebbing of the tide. Richard II. took refuge in this castle, on his return from Ireland in 1397, and was delivered from the power of his enemies from it, through the treachery of the Duke of Northumberland. During the civil war, Charles I. particularly resolved, Williams, archbishop of York, to put the castle in a complete state of defence, for his use, and pledged his honour that the custody of it should remain with the prelate, or any person he thought proper to appoint, till the sum expended was repaid. When the repairs were accomplished, Williams placed the castle under the government of his nephew, William Hooker. The neighbouring gentry, conceiving it a secure depositary, sent their most valuable writings and plate to the keeping of the archbishop and Hooker; the former giving his receipts, and making himself responsible in case of loss. About a year afterwards, colonel Sir John Owen obtained the appointment of governor of Conway castle from prince Rupert, and, proceeding suddenly to the place, ejected the prelate and his adherents, who were positively denied permission to remove the articles, for which receipts had been given. Greatly irritated at this unworthy conduct, Williams vainly applied to the court for redress. Yielding at length to the representations of general Mytton, who commanded the parliament's army, he adopted their caulk, and fortified his own house, which was garrisoned by Mytton's troops. A conflict soon afterwards occurred, in which the prelate was wounded in the neck. After the ravage of the civil wars, a grant was made of it to Edward, earl of Conway, who, in 1665, demolished the buildings. At present it is held by a private proprietor under the crown. A little hill is planted and laid out towards the mouth of the river, commanding a fine view of the town and castle on one side, and the sea on the other, to which is given the classical name of Arcadia. The ruins are still uncommonly magnificent, and bounded by the river, a creek, and the town. The walls are not greatly injured; and eight vall towers, surmounted by turrets, are yet standing. In one of these is an oriel window, richly ornamented, where the toilet of queen Eleanor is said to have stood, at the period when her lord made the castle the scene of his hospitality: another of the towers, undermined by the inhabitants of Conway, split asunder, and a vast fragment fell upon the beach, where it lies, a wonderful specimen of ancient masonry. The hall, erected over extensive vaults, is lighted by fixed windows towards the country, and three towards the opposite side. Six of the eight pointed arches of the roof are yet entire. The length of the hall is 139 feet, and the breadth 52. The castle is now held from the crown by O. Holland, esq., who pays a rent of 62. 8s., and is bound to furnish lord Hertford with a dish of fish, whenever he passes through Conway. However commanding and beautiful the town appears without the walls, the contrast within is melancholy in the extreme, where ruins and defoliation prevail in every direction. Edward I., when he passed a Christmas here with his queen Eleanor and the whole court, erected the place into a free borough, and the mayor was constituted constable of the castle. The present government is composed of an alderman, recorder, coroner, water bailiff, &c. Mr. Evans mentions, in his "Tour through North Wales," an old house situated in Castle-street, called the college; with a curious window, and several coats of arms of the Stanleys; and another of large dimensions, named Pen Mawr, built in 1582, by Robert Wynne, esq., of Gwydir, which he resupposed, from the inscriptions on the front, to have been erected for charitable purposes, particularly as there are many rude badges within, (probably of contributors); and the supporters of the arms of Dudley, earl of Leicester, decorate the walls and ceiling. The only religious structure in Conway was an abbey of Cistercian monks, founded by prince Llewelyn ap Jorwerth, and the son of Edward I., who was slain before his body remained till the dissolution of the monastery, when it was carried to Llanrwst. Edward I., conceiving the monks improper inmates of his fortress, removed them to a new abbey, which he erected near Llanrwst, but did not deprive them of their privileges and endowments. Their old church was then made parochial, and the presentation granted to the abbot and convent, on condition they provided three chaplains, two of whom were to be Englishmen, and the third a Welshman; one of the former received the title and office of vicar, and, after having been named by the convent, was to be presented by the diocesan. The church of the original foundation is situated in the centre of the town; but it is more remarkable for its remote antiquity, than any beauty in the form or decorations. Cynap ap Owen Gwynedd was buried in this church, 1223; and there are at present several modern monuments of the Wynne family: one of the inscriptions within it records the interment of Nicholas Hooker of Conway, gentleman, in 1637, who is said to have been the 21st child of his father, by his wife Alice, and the father himself of 27 children. The tithes of the church are vested in three trustees, for the benefit of the poor of the town, and three villages in the neighbourhood: indeed the want of trade and manufactories renders the lower classes truly wretched, many of whom obtain a miserable subsistence by collecting and burning into barilla, on the beach, different species of fuel or sea wreck, which is sold for trifling sums to the purchasers, who make a great profit on their labour. The inconsiderable trade now carried on consists of cooper, lead, calamine, and potatoes for exportation; but little or nothing is imported. As Conway has hitherto been the great thoroughfare to Ireland, the inhabitants derived much advantage from the passengers; but the new road through the Owyaun mountains will soon rob them even of this support. Hills of lime-stone abound near this town, and some lead and copper mines, having chert, or a species of black hornstone for a matrix. In a black hinds mountain here marls of porons chert are found; which, on trial, are found as fit for making our mill-stones as those imported from France. Mr. Richard Bowes, who made this discovery, and sent specimens of the marl to the Society of Arts, was rewarded by that patriotic body. See their Transactions, vol. viii. p. 197. Situated 240 miles N.W. of London. Population in 1851 was 889; the number of houses 182. Bingley's and Evans's Tour in North Wales.

Conwy, a township of America, in the province of New Brunswick, Sudbury county, on the western bank of St. John's river. It has the bay of Fundy on the south; and at the westernmost point of the township there is a tolerably good harbour, called Musquash Cove.—Alfo, a township in the N.E. corner of Strafford county, New Hampshire, on a bend in Saco river, incorporated in 1765; and containing 574 inhabitants. It was called "Pig-wacket," by the Indians.—Alfo, a thriving township in Hampshire county, Massachusetts, incorporated in 1767, and containing

Conway, Cape, a point of land on the east coast of New Holland, so called by Captain Cook in 1770, and lying in 8° lat. 26° 36'. W. long. 211° 28'; between which and Cape Hillborough is a bay, which the name navigator called Raffee Bay. Within this cape there lie two or three small islands, which serve to shelter that side of the bay from the southerly and south-easterly winds, that seem to prevail here as trade-winds. Among the many islands that lie upon this coast, called by Cook Cumberland Islands, one is more remarkable than the rest; it is of small circuit, very high, and peaked, and lies E. by S., 10 miles from Cape Conway, at the utmost end of the passage. This passage is from three to seven miles wide, and eight or nine leagues in length, N. by W. 1/4 W., S. by E. 1/4 E. It is formed by the main on the west, and by the islands on the east, one of which is at least five leagues in length. The depth of water, in running through it, was from 20 to 25 fathoms, with good anchorage everywhere; and the whole passage may be considered as one safe harbour, exclusive of the small bays and coves which abound on each side, where ships might lie as in a haven. The land both upon the main and the islands is high, and diversified by hill and valley, wood and lawn, with a green and pleasant appearance. This passage, being discovered on Whitunday, was called Whitunday Passage.

Conya, a river of South America, in Surinam, or Dutch Guiana.

Conybear, John, in Biographia, a celebrated English prelate, born in the neighbourhood of Exeter, and educated at the free-school in that city, from whence he was admitted to Exeter college, Oxford, where he applied himself so diligently to his studies, that, in 1710, when he was but 19 years of age, he was chosen probationary-fellow upon Sir William Petre's foundation. He obtained the several degrees with reputation, and was ordained priest in 1716. During the next year he officiated as curate at Fetcham in Surrey. Upon his return to Oxford, he became tutor to his own college, and gained much celebrity as a preacher. He was afterwards appointed by Dr. Gibson, bishop of London, to the situation of one of his majesty's preachers at Whitehall. In the year 1724, lord chancellor Macclesfield presented him with the rectory of St. Clements, Oxford; and in 1728, he took the degree of bachelor, and in the following year, that of doctor in divinity. In 1730, he was elected to the high and arduous office of master of Exeter college; and in a short time he undertook, at the desire of the bishop of London, and published a very excellent answer to Tindal's "Christianity as old as the Creation," under the title of "A Defence of revealed Religion against the Exceptions of a late Writer, &c." This was published in 1732; and before the end of that year he was raised to the office of dean of Christ-church. He now resigned the headship of his college, and speedily the rectory of St. Clements; and in 1734, he had the honour of entertaining, at his own apartments, the prince and princess of Orange, and of receiving the thanks of queen Caroline for his conduct on that occasion. From this period, to the year 1750, Dr. Conybear received no additional prebend; he was then appointed to the bishopric of Bristol, which, though it increased his dignity in church pretenion, was no addition to his fortune. This high honour was followed by a long train of ill-health, which terminated his valuable life in the year 1755. "The good prelate left behind him a truly estimable character; he fulfilled all the duties of life with honour to himself, and for the advantage of those connected with or dependent upon him. Zealously attached to the church, of which he was a distinguished member, he was, at the same time, candid and liberal towards protestant dissenters, with some of whom he had been educated, and with others he maintained an occasional but friendly correspondence through life. Two years after his decease, were published, for the benefit of his surviving relations, sermons in two volumes, 8vo. The very numerous list of subscribers who patronized this undertaking, flew in what high public estimation Dr. Conybear was held by his contemporaries."


Gen. Ch. Common calyx either imbricated, or in several nearly equal ranks. Cor. Florets of the dish hermaphrodite, numerous, tubular, funnel-shaped; border five-cleft, pataulous; florets of the circumference female, either apetalous or funnel-shaped, not composing a ray; border generally three-cleft. Stam. Filaments five, very short, capillary, anthers united into a hollow cylinder. Pist. in the disk. Germ oblong; style filiform, length of the flaments; stigma two-cleft; in the circumference fylces and stigma more flender. Seeds oblong; down simple. Recept. naked, flat.

Eff. Ch. Seeds of the calyx imbricated, or in several nearly equal ranks. Florets of the circumference female, apetalous, or funnel-shaped, with a three-cleft border, not composing a ray. Down simple. Receptacle naked.

* Leaves not docurrent.

* Herbaceous.

1. C. squarrosa. Linn. Sp. pl. 1. Matt. 1. Lam. 1. Wild. 1. Lam. fl. pl. 697. fig. 1. Gart. tab. 166. Eng. Bot. 1195. Flor. Dan. tab. 622. (C. major vulgaris; Bauh. Pl. 265. Tourn. 454. C. Matthiolii, baccarum Monspel- lium; Cluf. Hift. 2. 21. Lob. ic. 574. Blackw. tab. 102.) Great fleabane, or Plowman's spikenard. "Leaves ovate-lanceolate, downy; stem corymbous; calyx-scales falcate, recurved, and prominent." Root biennial, branched, and fibby. Whole herb soft and downy, in flavour bitter, and somewhat aromatic. Stem two or three feet high, erect, angular, leafy, but little branched, many-flowered. Leaves alternate, somewhat crenate, upper ones often entire. Flowers yellowish; calyx egg-shaped; outer scales green, recurved; inner ones reddish, erect, ciliated. Stigma angular; down falcate. Receptacle tuberous. A native of England, and other parts of Europe, on a dry calcareous soil. 2. C. linifolia. Linn. Sp. pl. 2. Matt. 2. (After dracunculoides; Lam. After foliago-noides; Wild. After americanus albus, mar 1 arabum exasperatia foliis; Pluk. aln. 36. tab. 79 fig. 2.) "Leaves linear-lanceolate, quite entire; corollas rayed." Stems a foot or a foot and half high, erect, hardy, green. Leaves resembling those of mezereon or hyssop, more observing, smooth, and hisp. Flowers on short terminal peduncles; floras white, fleshy, reflexed. Its radiate flower certainly excludes it from this genus; but as it is not infested in our work after After, we have retained it here. A native of North America. 3. C. jobria. Linn. Matt. 113. Matt. 7. Wild. 2. "Leaves oblong; somewhat toothed, saccate, falcate; peduncles one-flowered, elongated." Leaves rugous on both surfaces, four or five teeth on each side. Peduncles axillary, at the top of the branches, becoming finally six times the length of the leaves. A native of the East Indies. 4. C. symphytoides. Matt. 35. Houfion MSS. "Leaves oblong; egg-shaped, falcate; flowers in terminal racemes." Root perennial. Stem three feet high. Leaves four or five inches long, one inch and a half broad in the middle, rough, like
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like thole of comfrey. Flowers yellow; on branched peduncles. Sent by Dr. Houton to Miller from la Vera Cruz. 5. C. fabifolia. Willd. 7. "Leaves oblong, nearly entire, half embracing the item; peduncles one-flowered, finally much elongated." Stem much branched, diffuse, downy; branches thick set with leaves. Leaves alternate, downy on both surfaces. A native of the East Indies. 6. C. panulis Mart. 37. Willd. 4. Hort. Kew. 3. 133. "Leaves plane, terminal, villos under; calyxes somewhat glabrous; scales lanceolate, 3-angled; bracts spreading." Stem annual. Stem foot and half high, taper, slightly covered with a mealy down. Leaves about four inches long, and two broad in the middle, diminishing gradually in size on the upper part of the stem and branches. Flowers purple; peduncles at the end of the branches generally three-flowered; calyxes soft and swollen in the middle; foliis small and acute. A native of the northern parts of China, producing a succession of flowers from July to the end of autumn. 7. C. paniculata. Willd. 5. "Leaves oblong, soft, downy on both surfaces; lower ones petiolate; toothed; teeth reflexed; item panicled; corystes peduncled, axillary. Stem four feet high, about the thickness of a man's quill, erect, cylindrical, hollow, striated; branches alternate, erect, fine. Leaves on the stem petiolate, on the branches sessile. Calyx fleshy linear, 3-angled, spreading, reflexed. A native of the East Indies. 8. C. bifrons. Linn. Sp. Pl. 7. Mart. 9. Willd. 6. (Epapatora conyzoides maximana canadensis; Pluck. alm. 131. tab. 86. fig. 4.) "Leaves ovate-oblong, embracing the stem, serrate, wrinkled." Root thick, fibrous. Stems several, erect. Leaves rough. Flowers yellow, in round terminal branches. A native of Canada, flowering in July. Distinct from Inula bifrons. 9. C. biflorata. Linn. Sp. Pl. 9. Mart. 10. Willd. 7. (Epapatora conyzoides integracaulis facies; Pluck. alm. 130. tab. 177. fig. 1. C. axilariis. Linn.?) "Leaves oval, toothed; peduncles two-leaved; bracts opposite." Linn. "Leaves cupulitate-toothed; lower ones petiolate, roundish egg-shaped; upper ones sessile, oblong, wedge-shaped at the base; racemes axillary, leafy at the base, peduncled; Willd. "Leaves very egg-shaped, unequally and finely toothed, petiolate; racemes axillary, leafy at the base, forming a terminal pannicle;" Lam. Stem a foot and half or two feet high, simple, slightly fringed, downy. Stems alternate, soft, green, and almost smooth above, cinereous and downy underneath. Flowers small; bractes truly alternate, though some seem opposite; calyxes villos, reddish; Lam. Described from a dried specimen in the Herbarium of Comerion. In smaller specimens, probably the growth of a poor soil, the peduncles are one-flowered, with opposite bractes. In larger specimens the racemes are from three to six-flowered; peduncled, furnished with two, either opposite or alternate bractes, and sometimes with four alternate ones; bractes oblong, soft, generally entire; Willd. A native of the East Indies and the Isle of France. 12. C. cabina. Linn. Mact. 113. Mart. 11. Lam. 9. Willd. 8. Linn. Cochinchin. 495. (Sonchus volubilis; Rumphi. Amb. 5. 299. tab. 102. fig. 2.) "Leaves oblong, somewhat toothed, nearly sessile; peduncles woolly, about two-flowered." Branches with a few scattered hairs. Leaves alternate, wedge-shaped at the base, green on both surfaces, with a few scattered hairs, not frizzly; Linn. Stem somewhat shrubby, eight feet high, cylindrical, climbing, branched. Leaves broad-lanceolate, somewhat pubescent, scattered, petiolate. All the florets im- mered in a simple down; Linn. A native of the East Indies and China. 11. C. fructa. Willd. 13. "Leaves linear-lanceolate, attemated at the base, quite entire, hairy; flowers in Corymb; item peduncled, flat." Root annual. Stem 2 foot and half high, erect; branches short, erect, close to the item. Leaves alternate, numerous, an inch long, obtuse, with a point, narrowed at the base. Corymb small, fagitate at the tops of the branches. Flowers small; down reddish. A native of the East Indies. 14. C. canescens. Linn. Jun. Sup. 327. Mart. 5. Willd. 13. Thunb. prod. 153. (C. pini folia; Lam. 18. Elhythrum peregrinum angustifolium flocculis foliaceis in spicis crinitis dentibus; Seb. Mf. 1. 38.) "Leaves linear, whitish, broad laid on the edges; downy underneath; parce fagitate." Whole plant hairy. Stem from twelve to fifteen inches high, nearly simple, cylindrical, thick, with a large, broad, fliform, lateral branches short. Leaves three inches long, a line broad. Flowers purpure; calyx short; scales imbricated. lanceolate, villous, only half the length of the flowers; down intermixed with the florets; giving the flowers a feathered appearance. 15. C. oleifolia. Lam. 27. Willd. 13. (C. orientalis pulina micri oleascosio; Tourn. cor. 32.3.) "Leaves lanceolate, attenuated at the base, obtuse, coryst; coryst terminal; item simple." Root perennial. Stem seven or eight inches high, erect. Leaves not an inch long, three or four lines broad, scattered. Flowers in a close fagitate corymb; peduncles scaly; calyx oblong; scales closely imbricated, egg-shaped, obtuse; down reddish, longer than the calyx. A native of America. 16. C. viroflora. Mart. 14. Hout. MSS. "Leaves eggl-shaped, terrated, villous; flowers axilary and terminal." Root annual. Whole herb viscid. Stem a foot high, branched. Leaves one at each joint, sessile. Flowers white; peduncles slender; generally three-flowered. Seedly chaffy. A native of La Vera Cruz. 17. C. mollis. Willd. 19. "Leaves rhomboid-egg-shaped, nearly seltthy, toothed, pubescent, tomentous underneath; leaf nacked upwards; flowers in a corymb." Branches cylindrical, clefted, Leaves an inch long, very white underneath. Corymb terminal; branches alternate, few-flowered, divaricated; peduncles one-flowered; calyx-fleshes linear-lanceolate; stem long, whitish; 18. C. chenopodifolia. Lam. 12. Willd 20. "Leaves ovate-deltoid, unequally serrated. Soft; racemes short, terminating the item and branches." Stem tomentous upwards. Leaves alternate, petiolate, tomentous when young, afterwards nearly smooth. Flowers white, sessil, four or five together at the top of the item and branches; calyxes linear, very narrow, tomentous, almost equal; bractes cloathed with fine silky decumbent hairs. A native of the Isle of Bourbon. There is a variety with broader, roundish-egg-shaped leaves, a little cut at the base. 19. C. cinerea. Linn. Sp. Pl. 12. Mart. 14. Lam. 12. Willd. 21. (Senecio indica folium ternis crenatis; Burrn. Zeyl. 211. tab. 96. fig. 1. S. indica trium foliis; Mor. Hist. 312. tab. 17. fig. 7); Oines scrophulina; Rumphi. 6. tab. 14. fig. 1.) "Leaves egg-shaped, slightly crenate; lower ones obtuse, upper ones acute; panicles naked, terminal." Lam. Root annual. Stem about a foot high, slender, pubescent. Leaves small, rather dilatant, narrowed into a petiole, cinereous-green, whitish underneath. Flowers purple, small; peduncles branched, almost capillary; calyx-feales acute; down white, longer than the calyx. A native of the East Indies. 20. C. proflera. Lam. 7. Willd. 22. (Sonchus volubilis Javanus; Rumphi. 5. 299. tab. 104. 1") "Branches profleron at the top; leaves egg-shaped, toothed-angular, narrowed into a petiole; corymb close, terminal." Branches finely fringed, full of pith, scabrous, producing near the top some smaller villous branches, and giving the plant a proflerous appearance. Leaves small, acute, green, and almost smooth above, hoary, and cloathed with short hairs underneath. Corymb almost sessile; calyx-feales awl-shaped, down white, the length of the calyx. A native of the island of Java. 21. C. heterophylla. Lam. 8. "Some of the leaves a little heart-shaped; others
others rounder; flowers panicked." Stem about a foot and half high, branched, finely frayed, clothed with very short hairs. Leaves rather small, petiolate, crenate underneath. Flowers small; calyx-scales acute, purplish at the tip; down white, a little longer than the calyx. A native of the East Indies. 22. C. hirta. Lam. 5. Burm. Ind. 185. tab. 59. fig. 1. "Leaves somewhat lyrate, appearing torn, downy; flowers nodding." Stem about a foot and half high, simple, cylindrical, contract. Leaves alternate, obtuse; lower ones petiolate. Flowers in a small terminal panicle or raceme; peduncles axillary, very short; often in pairs; calyx-scales villous; scales imbricated, very narrow, awl-shaped; down whitish, not longer than the calyx. A native of Java. 23. C. bicuspita. Linn. Sp. Pl. 19. Mart. 19. Wild. 2d. Burm. Ind. 180. Loud. Cochinchin. 495. "Leaves oval, quite entire, scabrous, hirtute underneath." Stem a foot high, upright, simple, cylindrical, hairy. Leaves scattered, somewhat acute, sometimes edged with very minute teeth. Flowers yellow, crowded, terminal; calyx short, hairy. A native of Java, China, and Cochinchina. 24. C. paniculata. Willd. 25. "Leaves lanceolate-obovate, attenuated above and below, smooth, scabrous underneath, ferrate; branches one-flowered." Root annual. Stem from half a foot to a foot and half high, erect, frayed, a little branched towards the top. Leaves an inch and half long, green. Flowers large, solitary, terminating the branches; calyx-scales awl-shaped; down scabrous. A native of Africa, about the river Senegal. 25. C. egyppticum. Mart. 27. Wild. 26. Hort. Kew. 5. 1813. (Egeron egypthicum) Linn. Mant. 112. E. ferratum. Fodk. agyp. 148. C. capitate five globos. Docc. Sic. 13. tab. 7. fig. B. Moris. hist. 3. 144. tab. 29. fig. 14. Jacobea gasyp. fol. glauco coronop.; Boehr. lugdub. 99. "Leaves oblong-lpatulate, toothed, hairy; flowers in somewhat globular panicles; calyx-scales awl-shaped, soft." Root annual. Stem a foot and half high, erect, somewhat frayed, green, pubescent, a little vilcid. Leaves alternate, sessile, scarcely half embracing the stem, rather obtuse. Flowers yellow, terminal, four or five together, on purplish peduncles; calyx roundish; scales awl-shaped; florets minute; those of the circumference numerous; pilils yellow, quickly vanishing, surrounding the disk with a broad downy ring. A native of Sicily and Egypt. 26. C. Gounii. Linn. Mant. 169. Wild. 27. (Egeron Gounii; Jacq. Hort. 5. 43. tab. 79.) "Leaves lanceolate, ferrate near the top, scabrous at the edges; lower ones inerribly eggl-shaped; flowers clustered; calyx-scales lanceolate, membranous at the margin." Stem a foot high, simple, with a few erect hairs. Leaves: alternate, half embracing the stem, even-surfaced. Flowers panicled; calyx roundish, imbricated; scales smooth, convex, close; florets of the circumference apetalous, more numerous than those of the disk; ligula bifid, oblong. A native of the Canary Islands. 27. C. fengalenfis. Wild. 28. "Leaves oblong, inerribly eggl-shaped, toothed; teeth near the base; deeper flowers in somewhat of a close corymb." Stem frayed, hairy, hispid. Leaves sessile, hisbrous on both surfaces with calous points; lower ones an inch long. Flowers at the top of the stem; calyx-scales linear-lanceolate, scabrous. A native of Africa, about the river Senegal. 28. C. dentata. Willd. 29. "Leaves lanceolate, embracing the stem, dilated at the base, pubescent, toothed; branchlets one-flowered; peduncles elongated; stem hairy." Stem cylindrical, branched. Leaves an inch long. Flowers on long peduncles; calyx-scales linear-awl-shaped, scabrous; lower ones ciliated. A native of Africa about the river Senegal. 29. C. villa. Wild. 30. "Leaves lanceolate, embracing the stem, dilated at the base, villous, ferratrd; branchlets one-flowered; stem villous." But little different from the preceding. 30. C. aurita. Linn. jun. Sup. 357. Mart. 24. Lamb. 31. "Leaves toothed; root-ones smooth, inerribly eggl-shaped; stem ones oblong, pubescent, somewhat pinnatifid at the base; stem panicked; calyx-scales awl-shaped; outer ones hairy." Root annual. Stem a foot high, erect, red, hairy; branches erect, simple. Root-leaves marked with red veins, widely ferratrd, and crenated between the ferratures; stem-leaves somewhat lanceolate, soft; ferratrd near the top; bifurcated in the middle; somewhat pinnatifid at the base; leaflets-toothed along the whole margin; pinnus two or three on each side. Flowers white, small; those of the circumference linear; pilils longer, erect. A native of the East Indies. 31. C. guineense. Willd. 32. "Leaves toothed; root-ones scabrous, inerribly eggl-shaped; stem of the form lanceolate, villous, somewhat pinnatifid at the base; stem panicked; flowers in corolls; calyx-scales lanceolate; outer ones villous." Root annual. Stem a foot and half or two feet high, erect, villous. Root-leaves an inch and half or two inches long, obtuse, remotely ferratrd; lower stem-leaves inerribly eggl-shaped, an inch long, widely-toothed, deeply auriculate-toothed at the base; those of the branches half an inch long, lanceolate, villous, toothed, somewhat pinnatifid at the base; teeth profound; teeth of the base quite entire, not ferrated as in the preceding. Flowers in a terminal coroll; calyx-scales lanceolate, acute; outer ones shorter, villous. Nearly allied to the preceding, but differs in the form of the calyx, and the teeth of the lower leaves. A native of Guinea. 32. C. amplexicaulis. Linn. 10. Wild. 33. "Leaves lanceolate, nearly embracing the stem, somewhat toothed, hairy; stem branched, divaricated; peduncles one-flowered." Root annual. Stem from half a foot to a foot high. Root-leaves inerribly eggl-shaped, toothed; those of the stem oblong or lanceolate, remotely toothed, almost entire towards the top of the branches. Flowers resembling those of C. aurita; peduncles axillary, solitary, an inch or an inch and half long. A native of the East Indies. 33. C. obliqua. Willd. 34. (Egeron obliquum; Linn. Mant. 572.) "Leaves eggl-shaped, nearly embracing the stem, finely toothed, oblique; stem much branched; peduncles one-flowered." Root annual. Stem three inches long, erect, cylindrical, hairy. Leaves alternate, veined, not wrinkled, fragil, befit with a few scattered hairs. Flowers yellow, solitary, numerous; calyx cylindrical, pubescent; scales numerous, equal, awl-shaped, approximate; florets of the circumference scarcely conpiciuus, the ligulas of the disk erect, of the circumference spreading. A native of the East Indies. 34. C. orientalis. Willd. 35. (C. orientalis Adleri acri folio; Tourn. Cor. 38.) "Leaves scabrous, ferratrd; lower ones inerribly eggl-shaped, petiolate; upper ones lanceolate, sessile; flowers terminal, ciliated." Root perennial. Stem cylindrical, frayed, hispid-fuscous, branched at the upper part; branches short, simple. Flowers yellow, crowded, in a fort of corymb at the top of the stem and branches; calyx-scales awl-shaped. A native of America. 35. C. ficula. Willd. 36. (Egeron ficulum; Linn. C. ficula annua, folius atro-virentibus; Boc. Sic. 62. tab. 31. fig. 4. Moris. hist. 3. 115. tab. 29. fig. 28. Plunk. phyt. 168. fig. 2.) "Leaves linear-lanceolate, scabrous, nearly entire, revolute at the edges; stem panicked; peduncles one-flowered, leafy; lower calyx-scales lax." Root annual. Stems red. Flowers small; peduncles covered with minute linear, recurved leaves. In other respects resembling erigeron gravesens, but without a ray. Allied also to inula punicaris. A native of Sicily and the south of France. 36. C. sativa. Willd. 57. (Egeron festucoid. Linn. Senecio africans.
C O N Y Z A.

African, perenn.; Pluk. aln. 343, tab. 223, fig. 3.)

* Leaves linear, attenuated at the base; mucronate; corollae peduncle, close, terminal. Root perennial, too nearly allied to India festica, but has no ray. A native of Africa. 37. C. pungens. Lam. 21. Wild 38. (C. membranacea; Wall. act. 1719, p. 501.) "Leaves tricuspitate, awl-shaped, pungent; stem flabellated, angular, smooth." Stem a foot high, branched. Leaves alternate, dilatant; two lateral segments very short. Flowers yellow, large, foliose; branches thick, flat, downy; scales crenate, smooth; inner ones mucronate; down reddish, to length of the calyx. A native of Egypt, about Grand Cairo.

** Stems flabellate. 38. C. fasciculata. Linn. Sp. Pl. 1. Mart. 4. Lam. 23. Wild 45. (Hedychrysum flavulens; Baeh. Prod. 147. Hedychrysum syzygium; Tourn. 452. Hedychrysum capitulorum angustiramos; Mart. hist. 3. 87. H. fasciculata; Boce. Mart. 143. tab. 104. Chrysocoma latifolium; Barr. Lc. 425.)"Leaves linear, somewhat toothed; peduncles very long, one-flowered." Root perennial. Stems about a foot high, slender, branched, corymb; a little procumbent when young. Leaves an inch and a half long, two lines broad, green above, whitish beneath. Flowers yellow, foliose, on long peduncles; calyx-follicles oblong, somewhat flattened at the tip, lax. A native of Spain, Italy, the South of France, Portugal, &c. 39. C. rufa-f. Linn. Mant. 123. Mart. 6. Wild 41. (C. fasciculata 2. Lam. C. tamentosum; Forl. Ergyp. 75.)"Leaves fasciculate, somewhat toothed; peduncles elongated, one-flowered." Very like the preceding, but the flowering stems have axillary branches of smaller leaves. Leaves broader, shorter, more obtuse, all except the lowermost white on both sides. Flowers yellow; peduncle shorter and thicker, with one or two lanceolate, not bristle-shaped, bracteae; calyx-follicles not acute and patulous, but rather obtuse and closely imbricated; outer ones egg-shaped, brown at the middle, middle ones oblong, with a brown line on the back. A native of Arabia. 40. C. forfida. Linn. Mant. 466. Mart. 5. Lam. 22. Wild 25. (Glaaphalium forfida; Linn. Sp. Pl. Elschychrynum syzygium angustifolium, capitulos conglabulatos; Baeh. Pin. 264. Stachys cingulata; Spreng. longirostris folia; Bar. Lc. 368. & 277.)"Leaves linear, quite entire; peduncle long, three-flowered." Nearly allied to C. fasciculata. Stem resembling that of lavender, about a foot high, slender, corymbose. Leaves very narrow, soft, cottony, whitish. Flowers small; peduncles long, slender, cottony; calyx-follicles conic; scales imbricated, a little crenate at the tip. A native of the South of France and Italy. 41. C. erythrocarpa. Lam. 51. Wild 42. "Leaves linear, revolute, downy underneath; flowers globular, solitary, terminating the branches." Stem much branched; branches downy near the top. Leaves resembling those of physica eicosides, final, numerous, approximate, flatteret, spreading. Flowers at the top of the lateral branches, which are so disposed as to give the items the appearance of being covered with flowers; calyx-follicles linear, scarcely imbricated; outer ones downy on the back; down reddish. A native of Peru. 42. C. thyoides. Lam. 42. Illus. Fl. 697. fig. 5. Wild 44. "Leaves embracing the stem, egg-shaped, acute, keeled, compressed, imbricated in two rows; flowers foliary, sessile, lateral." A very upright plant in the form and disposition of its leaves, with somewhat of the habit of a Thunia. Stem a foot and half high, cylindrical, cottony towards the summit; branches in two rows, gradually diminishing in length from the bottom of the stem to the top. Leaves small, tufted, somewhat concave, villous on the inside. Flowers axillary; calyx-follicles few, oblong, smooth and even; down reddish. A native of Peru, found by Josephispalln. 43. C. sp. fidei. Lam. 43. Ill. Lc. 697. fig. 3. Wild 45. "With plant smooth; leaves minute, linear, egg-shaped, keeled, imbricated in four rows; flowers blue or terminal." A plant as regular as the preceding, with the habit and foliage of a corymb, and the flowers of an Acanthaceae. Stem a foot high, obtuse, cylindrical. Leaves thickly covering the branches. Flowers yellow, few, serrated; calyx cylindrical. Scales imbricated, obtuse, inner ones the largest. Found by Commerson in the Straits of Magellan. 44. C. hyemalis. Linn. Mant. 44. Ill. Fl. 697. fig. 2. Wild 46. "Leaves spiral, imbricated, prefl close to the branches; flowers solitary, terminal." A shrub fix or seven inches high. Stem bifid; branches erect, generally fasciculated so as to resemble ficaria pelluca. Stem three lines long, smooth, convex at the back, with two lateral furrows. Flowers white or lemon-coloured, sessile; calyx scales imbricated, similar to the leaves but smaller; down white, twisted and appearing ciliated. Tound by Commerson in the Isle of Bourbon. 45. C. brachyca. Lam. 45. Wild 47. "Prostrate; leaves linear, cordoned, hoary underneath; branchlets terminated with a sessile flower." A small shrub. Stem divided into numerous, short, procumbent branches, throwing out fibrous roots; branches erect, in close tufts somewhat in the manner of a Bryum. Leaves small, numerous, placed very near each other, green above, whitish and cottony beneath. Peduncles imbricated, rather short; calyx almost ciliated, containing from fix to fifteen flowers; scales imbricated, oblong; down the length of the calyx. Found by Commerson in the Straits of Magellan. 46. C. linearifolia. Lam. 49. Wild 48. "Smooth; leaves linear, nearly entire, narrowed towards the base; racemes short, leaty, terminal." A small much-branched shrub; branches slender, leafy towards the top, lightly iriately. Leaves an inch long, two lines broad. Flowers fllie or nearly so; calyx oblong, imbricated; inner scales linear-imbricate, white and crenatous at the edges; down reddish, thick length of the calyx. A native of the Isle of Bourbon. 47. C. punctata. Wild 49. "Leaves linear, acuminate, attenuated at the base, slightly marked with concave dots; peduncles very long, one flowered." Branches cylindricated, flattened, smooth. Leaves an inch and half long, alternate, crowded, somewhat flatter, rather feathery, quite entire and feathery at the edges. Peduncles at least half a foot long, solitary or in pairs, becket with awl-shaped dilated scales; calyx-follicles lanceolate, acute; down reddish. A native of Chili. 48. C. canariensis. Wild 52. "Leaves linear, attenuated at the base, rather obtuse, serrated; corymbose terminal." Branches cylindricated, younger ones pubescent. Leaves alternate, crowded, spreading; green on both surfaces, somewhat feathery. Flowers yellow; peduncles sessile; calyx-follicles oblong, closely imbricated. A native of the Canaries. 49. C. incana. Wild 51. (Erigeron incanum; Vail. Lc. 1. 72.) "Leaves linear, attenuated at the base, somewhat toothed, downy; corymbose terminal." Branches downy. Leaves sessile, approximate, rather acute, a little revolute at the margin. Corymbs many-flowered; calyx-follicles linear, somewhat villous; down ferrugineous, longer than the calyx. A native of Aruba Felix. 50. C. imbellis. Mart. 25. Wild 52. Hort. Kew. 3. 182. (Chrysocoma dichotoma; Linn. jun. Supp. 539. Jace. 1. 1c. Kar. I. tab. 171.) "Leaves wedge-shaped-linear, obtuse, crenate-toothed, smooth; anthers two-briddlet." Stem smooth, profligines, dichotomously branched. Leaves rather short, a little obtuse, somewhat feathery, with minute points. Flowers proposed.
Flowers yellow, in terminal simple corymb; peduncles hairy; bracts awl-shaped; calyx purplish. A native of rocky ground in the island of Teneriffe. 51. C. tumentos. Mart. 31. Mill. Dict. Hauft. MSS. "Leaves oblong-egg-shaped, downy, crenate underneath, flowers terminal, on branching peduncles." Stem ten or twelve feet high, much branched. Leaves alternate, on short pedicel. Flowers white, in loose unilateral spikes. A native of La Vera Cruz in New Spain. 52. C. ebracteolat. Willd. 53. Desf. Fl. Atl. 1, 269. tab. 252. "Leaves linear, quite entire, villous, hairs pressed close; peduncles leafy, one-flowered." Whole plant cinnereous, cloathed with thin, soft hairs pressed close to the peduncle. Stem a foot and half high, slender, branched. Leaves spreading. Flowers in loose panicles, on filiform peduncles; calyx ovate-cylindrical, scales linear, awl-shaped, imbricated, pubescent, membranous at the edges; florets of the circumference very small, scarcely conspicuous, without teeth. A native of Barbary. 53. C. coronatus. Lam. 35. Willd. 54. "Vifcid leaves linear-lanceolate, ferrate, flowers oblong, buried upwards; flowers globular in terminal corymb." 54. C. glutinosus. Lam. 32. "Leaves lanceolate, ferrate, green on both surfaces; vifcid when young." A shrub four or five feet high, smooth. Branches lax, cylindrical, slightly flexed, leafy towards the summit. Leaves ever-green, petiolate, acute, shining. Flowers yellow, numerous, small, in a compound terminal corymb; calyx roundish, imbricated with egg-shaped scales; florets of the circumference very small; down white, short. A native of the Isle of France. 35. C. appendiculat. Lam. 31. Willd. 60. "Leaves lanceolate, ferrated, downy underneath, appended at the base." Branches tubercled, corymbs terminal towards the summit. Leaves near four inches long, about an inch broad, green above, cottony and whitish underneath, furnished at the base with some narrow appendages which are decurrent along the pedicel. Flowers yellow, numerous, in a compound terminal corymb; peduncles and calyx cottony; bracts at the division of the peduncles linear. Found by Commeron in the 14th of Bourbon. 56. C. fulcifolia. Mart. 52. Lam. 33. Willd. 55. "Leaves linear-lanceolate, quite entire, revolute at the edges, attenuated upwards and downwards, downy underneath, corymb terminal, compound." Branches cylindrical, tubercled; younger ones downy. Leaves refembling those of Salix viminalis, two inches long, alternate, petiolated. Corymb divaricated; peduncles downy; calyces cylindrical, imbricated; outer scales egg-shaped, pubescent; inner ones longer, linear, smooth. There is a variety with very narrow, almost filiform leaves. 57. C. laurifolia. Lam. 34. Willd. 56. "Leaves oblong-lanceolate, narrowed at the base into a petiole, nearly entire; corymb terminal, compound, spreading." A very large shrub. Branches cylindrical, almost smooth, leafy on their upper part. Leaves about six inches long, rather more than an inch broad, feathered, slightly pubescent, sometimes slightly crenulate. Flowers numerous, globular; peduncles clothed with short, woolly hairs; calyx-ex.cales ovate lanceolate, almost smooth; down reddish. Found by Commeron in the 14th of Bourbon. It seems to have some affinity with Baechara arborea of Linnæus. There is a variety with smooth leaves broader at the top, smaller flowers and longer down, which perhaps may prove a distinct species. 58. C. miniflora. Mart. 38. Mill. Hauft. MSS. "Leaves lanceolate, acute, fcelife; flowers solitary, lateral, calyces coloured." Stem eight or ten feet high, with numerous, long, slender branches. Leaves three inches long, three quarters of an inch broad in the middle. Leaves growing close to the stems of the smaller branches. Flowers white, with a purple calyx,附着近基部的叶子，每片叶子于近枝端每一处基部。花瓣的长度约为六英寸，且略短于一英寸，被短而细的羽毛状物所覆盖。花柄呈圆锥形，并且略微膨大。花序为圆锥状，总体呈现出淡黄色。当花朵开放时，颜色呈现出淡紫色。
C O N Y Z A.

CORYZA.

bractes reflexed." Four or five feet high. Stem erect, branch- ed towards the top; branches divaricated, sub-divided, bend- ing down, diverging, villous, with a blackish flagmyna. Leaves two inches long, alternate, on short petioles, wrinkled, green above; pales, pubescent, and narrowly oblong. Flowers pale purple, in an umbellate spike, or rather racemes. A native of South America. 83. C. mucronata. Lam. 28. "Leaves ovate-lanceolate, petioled, entire, even-furrowed; spikes un- lateral, revolute, raked." Nearly allied to the preceding, and perhaps only a variety, but its leaves are even-furrowed above, and almost smooth underneath. Flowers in linear racemes, recurved like the tail of a scorpion; calyx-scales lanceolate; inner ones a little villous at the tip; down white. Found by Commeron in Brazil. 82. C. triangula. Lam. 57. Mart. 21. Lam. 29. Willd. 72. (C. frutecens, cyanidiofolia; Plum. Sp. 9. Burm. Amer. Tab. 95, fig. 1. Tourn. 457.) "Leaves flag-shaped, quite entire, obtuse; flowers white, alternate; branchlets rigid." A petty shrub, resembling rosemary, but with longer and more slender branches. Leaves numerous, alternate, petioled, white with down. Flowers purple, axillary, solitary. A native of South America. 86. C. incisa. Mart. 20. Willd. 43. Hort. Kew. 3, 1814. "Leaves flag-shaped, somewhat heart-shaped, hairy-villous, toothed, auricled at the base; receptacle honey-colored." Whole plant clothed with viscid hairs. Stem three feet high. Leaves an inch long, peti- oled, deeply cut. Corymb terminal, few-flowered, on long peduncles. A native of the Cape of Good Hope, found by Francis Mollon. 87. C. arborescens. Lam. 52. Willd. 73. "Leaves flag-shaped, veined, thinly toothed, crowded; flowers flag-shaped, terminal, globular." A smooth shrub, a foot and half high, or more. Branches erect, generally incised, leafy on their upper part, naked towards the base, and marked with the flowers of fallen leaves, with a decurrent leaf on each side. Leaves scattered, sessile, approximate, narrowed at the base. Flowers rather large, clustered; calyx imbricated; scales ovate-lanceolate; down reddish. Found by Joseph Jullien in Peru. 88. C. myrtifolius. Lam. 48. Willd. 75. "Leaves lanceolate, two-toothed; flowers globular, somewhat clustered, terminal." Branches slender, leafy on the upper part, somewhat angular. Leaves small. Flowers very small, almost sessile; calyx imbricated; scales egg-shaped, acute, slightly ciliate on the upper edge. A native of St. Domingo. 89. C. magellanica. Lam. 47. Willd. 76. "Smooth; leaves very small, ovate-wedge-shaped, ob- lomely three-toothed; flowers lateral, solitary, terminating the branchlets." A low, much-branched, spreading shrub. Leaves numerous, approximate, obtuse. Flowers oval, sessile; calyx-scales flag-shaped. Found by Commeron in the fronds of Magellan. 90. C. tenuifolia. Lam. 46. Willd. 77. (Erioger trenatum; Liam. jun. Supp.) "Smooth; leaves wedge-shaped, toothed towards the tip; flowers axil- lary and terminal, somewhat clustered." Much-branched, viscid. Leaves sessile. Flowers nearly sessile; calyx flag-shaped, imbricated; scales ovate-acute, a little scarious, fringed towards the tip; down reddish, longer than the calyx. Found by Commeron near Monte Video, and at the fronds of Magellan. The younger Linnæus's plant was found by Mattia in New Mexico. 91. C. reticulata. Lam. 39. Willd. 78. "Leaves ovate-wedge-shaped, retuse, crenated near the tip, pubescent; flowers globular, terminal, and axillary, forming a corystam." Stem a foot or half or two feet high; branches numerous, cylindrical, naked, and knotty below, leafy near the summit. Leaves scattered, thin, flat, succulent, with three or five longitudinal nervae. Flowers white; peduncles branched, pubescent; calyx hemispherical, imbricated; scales egg-shaped, inner ones somewhat scarious and lacerated at the edges; hermaphro- dite flowers of the 1st inflorescence; female ones of the cir- cumference in two or three ranks. Found by Commeron in the Isle of Bourbon. 92. C. brunfelsia. Lam. 50. Willd. 79. "Smooth; branches stiff; leaves oblong-egg-shaped, quite entire; flowers lateral, sessile." About four or five feet high. Branches erect, stiff, somewhat thick, angular, tubercled, leafy towards the summit. Leaves five or seven leaves long, flattened, approximate, almost sessile, narrowed towards the base. Flowers axillary, solitary; atan imbricated; flags ovate-oblong, slightly etiulate near the tip; down white. Found in Peru by Jophs. J. Flue. 93. C. carthagenensis. (C. ferrata; Mart. 53.) "Leaves flag-shaped, three-nerved; flowers in axillary spikes." Stem ten or twelve feet high, dividing at the top into many woody branches. Leaves an inch long, alternate, fitting close to the branches, acuminate. Flowers white. A native of Carthagena in New Spain.

Leaves decurrent.

Herbaceous or Shrubby.

94. C. genistoides. Lam. 56. Willd. 83. (Cassambar. Mary. Brat. 72.) "Stems somewhat shrubby, without leaves, nearly smooth; rings interrupted by joints, terminated by a short spike; flowers sessile, lateral, alternate." Stem from a foot to three feet long. Wings between each joint, broader on one side than on the other, decussated, green. Flowers yellow, situated at the joints in the upper part of the plant, solitary in the axil of the scale; calyx round, almost smooth, imbricated; scales ovate-acute; down reddish. A native of Peru. 95. C. articulata. Lam. . Ill. Pl. 651. fig. 4. Willd. 81. "Stem much branched, irregularly winged; leaves oblong-elliptical, shorter than the joints; flowers panicked." Stem a foot and half high; branches compound, smooth, viscid towards the summit. Flowers pale yellow, sessile, almost globular, often clustered together in a kind of terminal spike or panicle; calyx imbricated, scales obtuse. Found by Commeron at Monte Video. 96. C. fagittata. Lam. 58. Willd. 82. "Leaves decurrent, lanceolate, finely toothed, a little scarious, green on both surfaces; flowers clustered together at the top of the branches." Stem winged in the preceding. Leaves alternate, two or three inches long. Flowers from three to five in a cluster; calyx short, sessile egg-shaped, smooth pubescent; florets numerous; down longer than the calyx. Found by Commeron at Monte Video. 97. C. crispata. Willd. 83. Vahl. 1. 71. Forst. Arb. 119. n. 495. "Leaves lanceolate, serrate-toothed, naked; peduncles one-flowered; stem frubby." Whole plant smooth. Stem erect, frutified; branches and peduncles with curved toothed-inflated wings. Leaves an inch and half long, remote. Flowers two or three at the top of the branches; peduncles half an inch long; calyx-scales linear-lanceolate, the length of the florets in the circumference. A native of Arabia Felix. 98. C. arabica. Willd. 84. (Erioger decurrent; Vahl. Symb. 1. 72.) "Leaves linear, quite entire, downy; flowers panicked." Stem erect, frutified, pubescent, downy near the top; branches woody. Leaves an inch and half long. Pedicel capillary, with two minute bractes near the top; calyx sessile; scales brick- shaped, shorter than the down. A native of Arabia Felix. 99. C. leucantha. Willd. 85. Marsh. de Biberfih Pl. Caucas. "Leaves egg-shaped, mucronate, downy; lower ones serrated; flowers in corynba." Root annual. A native of Mount Caucasus, near the shores of the Caspian Sea. 100. C. vinga. Liam. Sp. 1. 4. Mart. 22. Lam. 53. Willd. 86. (C. helianthiflora; Pl. Sp. 9. 41. Burn.)
Burm. Amer. tab. 98, fig. 2. C. angustifolia subincana; Brown. Jam. 318. Helichrysum caule alato; Shaw. Jam. 125. Ht. tab. 266. tab. 152. fig. 5.) "Leaves linear-lanceolate, finely serrated, downy underneath; spikes terminal, elongated, interrupted." Root perennial, woody. Stem about two feet high, erect. Leaves five or six inches long, alternate, green and smooth above, whitish and downy underneath. Flowers yellow, purple, fleshy, lower ones three together, upper ones solitary; calyx oblong, imbricated; sessile, acute, hairy. A native of St. Domingo, Jamaica, and Carolina. 101. C. rupestris. Willd. 87. Vahl. Symb. 1. 71. "Leaves bipartite, crenated, downy underneath; flowers in a head." Branches woolly; leaves quite entire, smooth on one side, very downy on the other. Leaves an inch and half long, wrinkled, smooth above, downy underneath. Peduncles the length of the leaves, from the axils of the upper leaves. A native of Brazil. 102. C. alopecuroides. Lam. 54. Willd. 83. Plm. Sp. 9. Burm. Amer. tab. 98. fig. 1. "Leaves egg-shaped, finely serrated, downy underneath; spike terminal, dense, interrupted at the base." Root perennial, spindly-serrate, woolly. Stems about two feet high; leaves green on one side, white and downy on the other. Leaves alternate; green, smooth, somewhat wrinkled above, whitish and downy underneath. Flowers yellow, calyx imbricated, downy at the base; inner scales longer and smooth towards the tip; down rather long. A native of Maranhão and Brazil. 103. C. fixiflora. Lam. 54. Willd. 83. Coll. Cav. 1. 8. tab. 12. "Stem somewhat bristly, simple; leaves ovate-lanceolate, finely serrated, downy underneath; spike terminal, dense, entire." Stem a foot and half high, erect, fringed with green and white. Leaves three to four inches long, six or eight lines broad, alternate, green and smooth above, white and downy underneath. Flowers yellow; calyx clothed with a thick down, imbricated; scales narrow-lanceolate, inner ones longer. Female florets intermingled with the hermaphrodites. A native of South America. Obs. As the generic baccharis and conyza now fly, this species belongs to the former. 104. C. redolens. Willd. 90. (Gnaphalium redolens; Forl. Prod. n. 55.) "Leaves lanceolate, quite entire, downy underneath; spikes terminal, glomerated." Stem woolly, branched. Leaves half an inch long, obtuse. Spike half an inch long; calyxes villous. A native of New Caledonia. 105. C. decurrens. Linn. Sp. Pl. 6. Mart. 23. Wild. 91. (C. alopecuroides. B. Lam.) "Leaves lanceolate, finely serrated; stem somewhat dichotomous; flowers axillary, fleshy, glomerated." Root annual. Whole plant downy. Stem about three inches long, erect. A native of the East Indies.

Obs. The only essential distinction between baccharis and conyza confides in the former having the hermaphrodite and female florets intermingled with each other; whereas, in the latter, the female florets are all collected in the circumference, but without producing the compound flower properly radiate. In dried specimens, it is not always possible to determine these characters with certainty; so that, as La Marck observes, some of the foregoing species may belong to baccharis. Jussieu, Gérard, and La Marck, are of opinion, that the two genera are fearfully distinct. The latter, however, fuggles that two genera might be formed out of them. Distinguishing by the form of the calyx: one of them with the calyx of erigeron, i.e. not properly imbricated, having linear, nearly equal scales in several ranks; the other with the calyx of eupatorium, i.e. finely imbricated. It any of the species should be found to have all the florets hermaphrodite, they must be referred to eupatorium. Erigeron differs in having a radiate flower.


Conyza sibirboidea of Linnaeus and Martyn is after conyza of Willdenow. It is excluded from the present genus by its radate flower.

Coryza ugytica juniperiformis; Vail. See Stachelina spinosa.

Coryza sibirboidea, folio bullata acros: Pluk. See Chrysocoma comacea.

Coryza africana frutescens, folia eicrca bamaatis. See Steebe sibirboidea.

Coryza africana frutescens, folio suffusis; Tourn. See Tarchanthus campanulatus.

Coryza africana latifolia fatac; Pluk. Moris. See Gnaphalium fatatum.

Coryza africana tenuifolia subfrutescens; Dill. See Chrysocoma scabra.

Coryza americana frutescens fataciformis; Dill. See Baccharis fatac.

Coryza americana fructescens fataciformis; Dill. See Baccharis fatac.

Coryza americana frutescens fataciformis; Dill. See Baccharis fatac.

Coryza americana frutescens fataciformis; Dill. See Baccharis fatac.

Coryza americana frutescens fataciformis; Dill. See Baccharis fatac.

Coryza americana frutescens fataciformis; Dill. See Baccharis fatac.

Coryza americana frutescens fataciformis; Dill. See Baccharis fatac.
CON

CONZA fruticosa esili odore; Sloan. See Eupatorium villejum.

CONZA fruticosa esili odore, floribus pallide purpureis; Sloan. See Calea jammitensis.

CONZA helvitas multia incana; Lob. See Cineraria campesiris.

CONZA incana; C. Bauh. See Cineraria campesiris.

CONZA lini foliis aferosis; Aum. Ruth. See Chrysocoma hispifera.

CONZA lebata; Linn. See Calea lebata.

CONZA major altera; C. Bauh. See Baccharis Dioecoris.

CONZA major altera; Thal. See Buphthalmum falsicitulum.

CONZA major; Dd. See Inula viiceps. See Inula pulicaris.

CONZA marina; Magnol. Moris. See Erigeron tuberojum.

CONZA mas Theophrasti; C. Bauh. See Inula viciopsis.

CONZA media afferis flore luteo; C. Bauh. See Inula dysenterica.

CONZA media crispa; Rai. See Inula pulicaris. See Inula media, monfolieta affinis; J. Bauh. See Inula spuria.

CONZA melitensis; Bocc. See Inula sativa.

CONZA minimina; Dd. See Inula pulicaris.

CONZA minor exotica; C. Bauh. See Inula pulicaris. See Inula minor.

CONZA minor hispanicia; Pluk. See Inula pulicaris. See Inula minor vera; Lob. Bart. See Erigeron gruvelensis.

CONZA palustris serratifolia; C. Bauh. See Senecio palustris.


CONZA rufa; Hort. Kew. See Erigeron rugejum.

CONZA saudens, foliaris folio, angulojosa; Plum. See Mikania raudens.

CONZA sericac; Wild. See Chrysocoma serica.


CONZA sementofa & incana; Aum. Ruth. See Chrysocoma villosa.

CONYZIS Affinis; C. Bauh. See Inula brittanica.

CONZOIDES; Dill. See Erigeron aere.

CONZ. See Conospermum.

CONZA, in Geography, a town of Naples, in the province of Principato Ulitta, considered as the capital of the province; situated at the foot of the Appennines, near the head of the Ophanto; the site of an archbishop. The chief article of its commerce is marble. Distant 48 miles E. of Naples. N. lat. 40° 50'. E. long. 15° 10'.

COOCH Bahar, or Coos Bayha, a district of Bahar, in the province of Bengal, separated from that of Rungpore, by the river Durlah. In this district, an usage of a very singular kind has prevailed from remote antiquity, and actually exists at this day. If a riot, or peafant, owes a sum of money, and cannot satisfy his creditor, he is compelled to give up his wife as a pledge, and possession of her is kept till the debt is discharged. It sometimes happens, according to report, that the wife of a debtor is not received for the space of one, two, or three years; and then, if during her residence and connection with the creditor, a family shall have been the consequence, half of it is considered as the property of the person with whom she lived, and half that of her real husband. This country has a most melancholy appearance, and its inhabitants are a miserable and pusty race. Those of the lower ranks, without support, dispose of their children for slaves, to any purchaser, and for a very trifling consideration. Nothing is more common, in this unnatural traffic, than to see a mother drive up her child, and bring it to market, with no other view or hope, than to enhance the price she may procure for it. Indeed the extreme poverty and wretchedness of these people will sufficiently appear, when we reflect that the value of the peasant's subsistence amounts to no more than one penny a day, even allowing him to make his meal of two pounds of boiled rice, with a due proportion of salt, oil, vegetable, fish, and chili, the latter of which is a kind of red pepper, in universal use, made from the "caplixum annuum" of Linnaeus. The situation of the district exhibits an union of facts, not unfrequently observed, viz. the great facility of obtaining food, and at the same time the wretched indigence of the lower order of inhabitants. Turner's Thibet, p. 11, &c.

COOCHEN, LEONARD VAN, in Biography, a painter, born at Haarlem in 1610, and scholar of Jac. Jordaeus. He also amused himself with etching, and published three sets of prints in which the style of Salvator Rosa was imitated with the most happy success. These etchings, several of which represent groups of military figures, are dated from 1664 to 1666. He died in 1681. Heinecken.

COOK, JAMES, one of the most eminent navigators and discoverers of unknown territories and seas, recorded either in ancient or modern history, was descended from an obscure family in Northumberland: his father, James Cook, having occupied the humble station of a servant in his boyhood, and his mother, whose Christian name was Grace, being a person of the same rank and condition. The subject of this article claims a more distinguished notice, and a more extended detail of particulars, than we have been accustomed to introduce in those biographical sketches that occur in this work. Indepenently of the singular merit of Captain Cook himself, to which a peculiar tribute is due, his voyages and discoveries are so immediately connected with science, both geographical and nautical, as to entitle them to a conspicuous place in a general Dictionary of the Arts and Sciences. The parents of captain Cook, who were noted in their lowly station for honesty, sobriety, and diligence, were settled for some time before his birth at Marton, a village in the North Riding of Yorkshire; and in this place their son James, destined to give celebrity to their name and family, was born on the 27th of October, in the year 1728. Having received the first rudiments of education at his native place, he was further instructed in writing, and the first rules of arithmetic at Ayton, near which place his father was settled in the service of Thomas Skotow, esq.; and, at the age of 13 years, he was apprenticed to a shopkeeper, at Staithes, a fishing town about 10 miles from Whitby. The sea, however, was the object towards which he manifested an early inclination; and, in consequence of some disagreement with his master, he obtained his discharge, and determining to indulge his natural propensity, he bound himself for seven years to Mifters. Walkers of Whitby, quakers by religious profession, who employed two ships in the coal trade. At the expiration of his apprenticeship, he continued in vessels of this description, as a common laborer, till at length he was appointed mate in one of Mr. John Walker's ships. At this time, he was not distinguished by any
any peculiar traits of character, though without doubt he must have acquired a considerable degree of knowledge in practical navigation. In the spring of the year 1755, when hostilities commenced between England and France, Mr. Cook, and the ship to which he belonged, happened to be in the river Thames; and after concealing himself for some time, to avoid being impressed, he determined to enter voluntarily into the British navy. His first situation in his majesty's service, was on board the Eagle man of war, to the command of which, captain (afterwards Sir Hugh) Palliser was appointed in October 1755. As an active diligent seaman, he recommended himself to the captain's notice; and in consequence of his own acknowledged merit, as well as some private interference, he obtained the 19th of May, 1759, a master's warrant for the Grampus flag; but this appointment not taking effect, he was made master of the Garland, a ship which had failed before he could join her; and therefore, on the 19th of May, he was appointed to the Mercury. This ship was destined to North America, where he joined the fleet under the command of sir Charles Saunders, which, in conjunction with the land forces under general Wolfe, was engaged in the famous siege of Quebec. As it was necessary for the purpose of the expedition, to fortify St. Lawrence, between the island of Orleans and the north shore, directly in the front of the French fortified camp at Montmorency and Beauport, Mr. Cook was recommended by captain Palliser, who well knew his facility and resolution, to this difficult and hazardous service. He performed it, with great personal risk, to the satisfaction of his employers; and furnished the admiral with a complete and correct draught of the channel and foundings. Before this time, it is thought that he had scarcely ever used a pencil, and that he had no knowledge of drawing. He afterwards surveyed those parts of the river, below Quebec, which navigators had found to be attended with difficulty and danger; this business was executed with his customary diligence and skill; and when his undertaking was finished, his chart of the river St. Lawrence was published, with the necessary foundings and directions for navigating that river. This chart has superseeded the necessity of any other. After the expedition to Quebec, Mr. Cook was appointed, by warrant from lord Colvill, master of the Northumberland man of war; and in this station, his conduct was such, as to gain him the esteem and friendship of his commander. During the station of his ship at Halifax, he read Euclid, and devoted his leisure hours to the study of astronomy, and other branches of science. In September 1762, the Northumberland came to Newfoundland, to assist in the capture of the island from the French; and after this service was accomplished, Mr. Cook surveyed the harbour of Placentia, and the heights of the place, with a diligence which engaged the notice of captain (afterwards admiral) Graves, the governor of Newfoundland. The governor formed a very high opinion of his abilities and character; and this opinion was amply confirmed by the concurrent testimony of all the officers under whom he had served. Upon Mr. Cook's return to England, towards the close of the year 1762, he married an amiable woman, who deferred and enjoyed his tenderest affection and regard. Early in the year 1763, he accompanied captain Graves to Newfoundland, as surveyor of its coasts; and having executed the business that had been assigned him, he returned to England. In April 1764, he was appointed, under the orders of commodore Palliser, marine surveyor of Newfoundland and Labrador; and of the satisfactory manner in which he executed this office, the charts which he afterwards published, afford fullest evidence. These services were continued till the year 1767; and whilst he was employed in them, he transmitted to the Royal Society an observation of the eclipse of the sun at Newfoundland, with the longitude deduced from it, (see Phil. Trans. vol. 57.) from which our navigator appears to have already acquired the character of an able mathematician. But a new and more interesting scene opens upon us in the profession of these memoirs. A spirit of discovery had been excited towards the latter end of the 18th century, and in the following century it was very vigorous and active; but soon after the commencement of the 18th century, it began to decline: at a subsequent period, during the reign of king George II., it again began to revive; and two voyages were performed for the purpose of discovering a north-west passage through Hudson's Bay. But the modesty of his spirit was exhibited during the present reign; and it was reserved for Mr. Cook to furnish the most illustrious example of its influence. Soon after the peace of 1763, two voyages round the world were undertaken by captains Byron, Wallis, and Carteret, to whom we are indebted for several discoveries, which served to extend the knowledge of geography and navigation; but before the return of the two last, our navigator, with others, was employed on a more extensive scale than either of the former. The transit of Venus in 1769, was very likely to be observed with the greatest advantage in some of the islands of the South Seas, and afforded a peculiar inducement to this expedition; and after a variety of preliminary consultations and debates, Mr. Cook, who was strongly recommended by Mr. Stephens, secretary to the admiralty, and by sir Hugh Palliser, who had long known his abilities and character, was appointed to the command of it, with the rank of a lieutenant in the royal navy, to which he was promoted on the 24th of May 1768. A vessel of 370 tons, called the Endeavour, was prepared for this purpose; but before the necessary arrangements were completed captain Wallis returned, and upon being consulted he recommended Port Royal Harbour in George's island, now known by the name of Otaheite, as the most proper place for the proposed observation of the transit. Lieutenant Cook was accompanied by Mr. Charles Green, who had been pupil to Dr. Bradley at the Royal Observatory at Greenwich, and also by Joseph Banks, esq. now sir Joseph Banks, bart. and president of the Royal Society, and Dr. Solander, gentlemen who zeal for the propagation of science have been uniform and ardent. Lieutenant Cook had further views in this voyage than the mere observation of the transit, and accordingly, when his business was accomplished, he was directed to pursue further discoveries in the great Southern Ocean. The complement of Cook's ship consisted of 84 persons, besides the commander; she was provisioned for 18 months; and furnished with carriage and 12 small guns, together with an ample stock of ammunition and other necessaries. On the 26th of August our navigators set sail from Plymouth Sound; and on the 11th of September anchored in Tuncialea road, in the island of Madeira. Here they were hospitably entertained; and having landed in a fresh flock of beef, water, and wine, they left the island in the night of the 18th of September. In their way to Rio de Janeiro, they had an opportunity of ascertaining the luminous appearance of the sea, which had been often noticed by navigators, and ascribed to various causes. They determined by experiment, fully to their satisfaction, that the phenomena they observed proceeded from some luminous animal. Their reception at Rio de Janeiro was very different from that which they had met with at Madeira; and it was through mere necessity that they were detained there from the 13th of November to the 7th of the following
following month, when they proceeded on their voyage.
On the 13th of January 1769, lieutenant Cook entered the
frait of Le Mairc, and having contended for some time
with a violent tide, he anchored on the next day, first be-
fore a frant coast, which was understood to be Port Maur-
rice, and after ward the bay of Good News. He was the
content of the Endeavour in this station, Mr. Banks, Dr.
Solander, Mr. Monkhouse the surgeon, and Mr. Green
the astronomer, with their attendants and servants, and two
seamen, ascended the mountains in search of plants. This
excurion has been often related, and the effect of the cold
of the climate is well known. (See Cook. For an account
of the inhabitants of the desolate regions adjacent to
this frant; see Le Mairc.) It has been a question among for-
mer navigators which is the best passage from the Atlantic
to the Pacific ocean; and the doubling of Cape Horn has
been so much de-eded, that it has been thought more eligi-
able to pass through the frait of Magalhaens or Mag-llan.
Lieutenant Cook has settled this point; for he was no more
than 33 days in coming round the land of Terra del Fuego,
from the E. entrance of the frant of Le Mairc till he had
advanced about 12 degrees to the wellward and 38 to the
northward of the fraits of Magalhaens, and during this time
the ship received scarcely any damage; whereas it would
have required three months to reach the Pacific ocean
through this frant, and in passing it his people would have
been much fatigued, and the anchors, cables, falls, and
rigging of the vessel would have been much injured. In
short, lieutenant Cook, by fitting the example of doubling
Cape Horn, and by accurately ascertaining the latitude and
longitude of different places, as well as by his instructions
to future voyagers, has performed the most essential service
to this part of navigation. In the prosecution of the voyage
from Cape Horn to Otaheite, several islands were discovered,
to which were given the names of Lagono island, S. lat.
18° 47', W. long. 120° 28', Thum-b-cap, S. lat. 18° 35',
W. long. 130° 48', Bow island, S. lat. 189° 33', W. long.
18° 14', the Groups, the eastermost in S. lat. 18° 12',
W. long. 142° 42', Bird island, S. lat. 17° 48', W. long.
142° 43', and Chain island, S. lat. 17° 25', W. long.
145° 54'. Most of these islands were inhabited; and the ver-
dure, or groves of palm-trees, which were visible in some of
them, gave them the appearance of a terrestrial paradise to
persons who had hitherto witnessed the dreary coasts of Terra
del Fuego.
On the 15th of April the Endeavour anchored in Port
Royal bay, called by the natives “Matavai,” in the island of
Otaheite. Having fixed upon a place proper for accom-
plishing the grand object of their commission, they erected
an observatory, S. lat. 17° 29' 15", W. long. 145° 32' 36", and
carried their astronomical quadrant, and some other in-
struments, on shore. On the following day, very much to
their surprise and grief, the quadrant was not to be found.
By the judicious and spirited exertions of Mr. Banks, the
instruments was restored. The transit was observed with
great advantage. A particular account of the observation
may be seen in the Phil. Trans. vol. 1st, p. 307. See Ve-
nus. As we shall have occasion to mention some of the
leading circumstances that occurred on this and other visits
to Otaheite, under that article, we shall attend lieutenant
Cook in his departure from the island. Previously to their
setting sail, Tupia, one of the natives, the prime minister of
Oberea, when she was in the height of her power, and chief
priest of the country, who had been a constant companion of
the English during their abode on the island, came on board
the ship, with a boy thirteen years of age, and intreated
that they might be permitted to proceed with them on their
voyage. Lieutenant Cook gladly accepted the proposal.
On the 13th of July the English weighed anchor, and
while they were proceeding on their voyage, Tupia in-
formed lieutenant Cook, that at four of the neighbouring
islands, which he distinguished by the names of Huaheine,
Ulritea, Otahah, and Bobsbola, they might procure hogs,
swans, and other refreshments, in great abundance. Ac-
cordingly, passing the Tellusvrau, they approached the N.W.
part of Huaheine on the 16th of July, and in the af-
ternoon anchored in a small but excellent harbour on the
W. side of the island, called Ohware; and having procured
a variety of necessaries articles of refreshment, they failed on
the 19th for Ulritea, in a good harbour of which the ship
anchored on the next day.
The lieutenant hoisted an English jack on this island, and,
in the name of his Britannic majesty, took possession of this,
and the three neighbouring islands, Huaheine, Otaha, and
Bobsbola, all of which were in fight. The harbour or bay
in which the Endeavour had anchored was called by the na-
tive Opoony, and extends almost the whole length of the easter
side of the island. In its greatest extent it is capable of ac-
commodating any number of ships. After having surveyed the
northern and southern parts of this island, they set sail on
the 24th; but after encountering considerable danger and
discovering several small islands, they returned to Ulritea, and
anchored on the 11th of August in a harbour on the west side
of the island. Tupia had previously apprized them of the
formidable character of the inhabitants of Bobsbola, but on
intercourse with them, and particularly with Opoony, they
found there was no foundation for the terrors which Tupia
had endeavoured to excite. Having finished their necessary
repairs, and obtained a fresh stock of provisions, they pre-
pared for leaving the island. The principal islands, about
which the English had now spent somewhat more than three
weeks, were six in number; viz. Ulritea, Otaha, Bobsbola,
Huaheine, Tuba, and Maurua; which see respectively. Our
voyagers purposed their course till the 15th, when land was
discovered bearing S. E., and which Tupia informed them
was an island called Oheteroa. As the inhabitants manifested
a hostile disposition, lieutenant Cook, with equal wisdom and
humanity, made no attempt for land ing. By Tupia our nav-
igators were informed, that various islands lay at different
distances, and in different directions from Ohe teroa, between
the south and the north-west; and that to the north-west
there was an island called Manua, or Bird island. He also
described several islands towards the west; probably Boi-
cawen and Kepell's islands, which had been discovered by
Captain Wallis. The farthest island towards the south, of
which Tupia had any knowledge, was called Mautou, about
three days sail from Ohe teroa. But his father, he laid, had
informed him, that there were other islands farther to the
south. Lieutenant Cook determined, all circumstances duly
considered, to land southward in search of a continent. On
the 15th of August, our voyagers failed from Ohe teroa, and
on the 30th, in lat. 38° 26', W. long. 145° 6', they ob-
erved a comet, the tail of which subtended an angle of 42
degrees. On the 6th of October they discovered an extensive
tract of land, which they at first conceived to be the “Terra
Antarctica incognita,” but which proved, in the event, to be
a part of New Zealand. Lieutenant Cook, having anchored,
on the 8th, in a bay, at the entrance of a small river, went on
shore, accompanied by Mr. Banks and Dr. S-lander, and at-
tended with a party of men, in order to have some intercours
with the natives. They assumed a very hostile appearance;
and made attempts for running away with the horses, which
had been left at the entrance of the river. On the next day
they exhibited the same formidable aspect, brandishing their
plow...
pikes and lances. Tupia addressed them in a language, which was a dialect of their own and which they understood; inflaming them that their voyagers only wanted provisions and water, in exchange for iron, the properties of which he explained as far as he was able. Their intentions, however, appeared to be unfriendly; and on the iron and beads, which were presented to them, they seemed to get little value. Tupia told them at length, that if they proceeded to any farther violence, some of them must fall victims to the just retaliation of the English. This salutary counsel, however, produced no effect; and some were killed, and several wounded in the conflict that ensued. The severity exerted on this occasion, was very different from the conduct which Mr. Cook’s prudence and humanity suggested in other cases; and, on a calm review, it was not approved by himself; but he pleaded the nature of the service in which he was employed and the necessity of obtaining a knowledge of the country, which he had previously attempted to acquire by kind treatment, and with a view to which he was at length obliged to recur to hostile and fatal measures. The lieutenant finding all his efforts to establish an intercourse with the natives unavailing, determined to re-embark, and on the 11th of the month he left this inhospitable place, which, as it had supplied him with no article except wood, he denominated Poverty-bay, called by the natives Toodaoo, or Long Sand, and situated in S. lat. 38° 43’, and W. long. 181° 30’. In this course he spent nearly six months, and made large additions to the knowledge of geography and navigation. By making the whole circuit of New Zealand, he ascertained it to consist of two islands. While the ship was hauling to the south end of a small island, called Teadeadey by the natives, and by the lieutenant “Portland island,” it suddenly fell into tidal water and broken ground. The inhabitants, perceiving its defects, put off in five canoes, and assumed a very formidable and menacing aspect, and seemed to be prepared for action; and it was to little purpose that guns were fired in order to intimidate them. Whilst some kind of traffic was carrying on with one of the canoes, Tupia’s boy, who was standing on the side of the ship, was seized by one of the New Zealanders, and carried off. Upon this atrocious act the marines were ordered to fire; and during the confusion that ensued, the boy made his escape and swam to the ship; though he was pursued by the largest of the canoes. To the cape where this unhappy transaction occurred, Mr. Cook gave the name of “Cape Kidnappers;” it lies in S. lat. 39° 43’, W. long. 182° 24’. Between this cape and the island Portland Island is a bay, which, in honour of Sir Edward Hawke, the lieutenant called “Hawke’s bay.” While, on the 18th, the Endeavour lay abreast of a peninsula within Portland island, called Tindaadu, two of the natives, supposed to be their chiefs, came so far in Mr. Cook, as to venture on board the ship, and remained there all night, their canoe being hoisted into the bay. On the 23rd, while the ship was in Tindaadu bay, lieutenant Cook went on shore to examine the watering places, and found the water excellent and conveniently situated, and the disposition of the people much more favourable than he expected. This lay in S. lat. 35° 22’ 44”, and W. long. 180° 47’. Here they supplied themselves with as much wood and water as they wanted. On the 28th, some gentlemen of the Endeavour went on shore on an island which lies to the left hand of the entrance of Tolaga bay; and there saw the largest canoe which they had yet observed; her length being 684 feet, her breadth 5 feet, and her height 3 feet 6 inches. While the ship was in Hicks’s bay, the inhabitants of the adjoining coast were found to be very hostile. Early on the 18th of November, they counted 45 canoes coming from the shore towards the Endeavour, and several others following them from another place. Some of the Indians traded fairly; others added derision and insolence to fraud; and though several small shot were fired at them, the canoes merely depended a-far, and set up their song of defiance as they departed from the ship. In standing westward from a small island called Motumobora, the Endeavour encountered some danger amidst the adjacent rocks, but at length it escaped without injury near an island called by the lieutenant the Mayer; the inhabitants of the neighbouring coast displayed in many instances their hostility, and, in their traffic with our navigators, committed various acts of fraud and robbery. Here, viz. in S. lat. 36° 48’ 55”, lieutenant Cook and Mr. Green made an observation of the transit of Mercury. In the mean while the ship was visited by two large canoes, one of which indicated hostile intentions on the part of its crew. In the course of their traffic, they were guilty of an act of fraud, accompanied with menaces and defiance, which induced Mr. Gore to fire at the offender and to kill him. At length, however, in consequence of small shot fired over their heads, they all fled with the utmost precipitation. On the 10th, our commander, accompanied by Mr. Banks, and the other gentlemen, examined a large river that empties itself into the head of Mercury bay, and found the situation abounding with conveniences, capable of an easy defence, which are admirably fitted for retaining beds of excellent oysters; this river Mr. Cook called Oyster river. On the 15th he sailed out of “Mercury bay,” so called in consequence of the observed transit of Mercury over the sun, and lying in S. lat. 36° 47’ W. long. 184° 4’. Another river lies at the head of the bay, which is the bell or safe path for a ship that wants to stay for any length of time. This the lieutenant, observing a number of Mangroves about it, called “Mangrove river.” Before the Endeavour left the bay, Mr. Cook, having displayed the English colours, took formal possession of the place in the name of his Britannic Majesty, King George III. In the range from Mercury bay several canoes appeared apparently for hostile purposes; but their occupiers were instantly dispersed by a musket ball, fired through one of their boats; although Tupia’s oratory had proved ineffectual. While Mr. Cook remained in the “Bay of islands,” he took occasion to examine the interior part of the country and its produce. Some circumstances occurred which produced disagreement between the navigators and the inhabitants, and it required singular exertions of prudence, as well as of humanity on the part of Mr. Cook, to bring them to a termination. The number of inhabitants in the Bay of islands was found to be much greater than in any other part of New Zealand which the commander had hitherto visited; and though they did not appear to be united under one head, and though their towns were fortified, they seemed to live together in perfect amity. The Endeavour on the 9th of December, lying becalmed in “Double bay,” an opportunity offered for making inquiries among the natives concerning their country; and Tupia enabled the lieutenant to learn that at some distance, at a place called “Moore-whenua,” the land would take a short turn to the southward, and thence extend no more to the west. This place the English gentlemen concluded to be the land discovered by Tafman, and which he had named “Cape Maria Van Diemen.” The inhabitants, who seemed to be intelligent, farther informed them, that there was a country of great extent, to the N.W. by N. or N.N.W., called Ulinaaroa, where it was understood the people eat hogs. Our navigators, on the 30th of December, saw the land, which they judged to be “Cape Maria Van Diemen,” and which corresponded with the account given of it by the Indians. The next day, they had demonstrative evidence, from the appearance
once of mount Carmel, that, where they now were, the breadth of New Zealand could not be more than two or three miles from sea to sea. During this part of the navigation, they encountered, in S. lat. 3°, and in the midst of summer, a long-continued and violent gale of wind; but as they were at a considerable distance from the land, they escaped the danger that alarmed them. The shore at "Queen Charlotte's Sound," where the English had arrived on the 14th of January, 1770, seemed to form several bays, into one of which lieutenant Cook proposed to take the ship for necessary repairs, and for obtaining a recruit of wood and water, of which they were supplied with great plenty. On landing they found an Indian family, in which they found horrid and indescribable proofs of the custom of eating human flesh. Evidences of the same custom appeared likewise on several other occasions. While they were near this part of the country, they were entertained with the most enchanting melody of birds, which began their song about two hours after midnight and continued it till sun-rise; thus refembling the nightingales of our own country. Lieutenant Cook, upon ascendimg one of the hills of the country, had a view of the sea on the eastern side of it, and of a passage leading from it to that of the west, a little east of the inlet where the ship lay. The main land, S. E. of this inlet, appeared to be a narrow ridge of very high hills, forming part of the S.W. side of the strait. On the opposite side, the land trended away E. as far as the eye could reach; and to the S.E. was discovered an opening to the sea, which washed the eastern coast. The lieutenant saw, also, on the E. side of the inlet, some islands which he had before taken to be part of the main land. In returning to the ship, he examined the harbour and caves that lie behind the islands which he had seen from the hills; and he employed the next day in farther surveys and discoveries—the gentlemen of the ship also accompanied him in visiting a town, which was built upon a small island or rock, very difficult of access, and which consisted of between 80 and 100 houses; the inhabitants of which were very friendly and attentive, and furnished them with a large quantity of dried fish. From a lull of considerable height, which afforded a view of the coast to the N.W., the farthest land that appeared was an island at the distance of about 10 leagues, lying not far from the main; between this island and the place where the commander dived, he discovered, close under the shore, several other islands, forming many bays, in which there appeared to be good anchorage for shipping. On the 30th of January the inlet where our voyagers now lay was named "Queen Charlotte's Sound," and a memorial was erected of their visit to this place. At the same time Mr. Cook took formal possession of this and the adjacent country in the name of king George III.; thus precluding the claims of future navigators, but revering to the original inhabitants their natural rights. On Monday, the 5th of February, the Endeavour, after encountering a violent storm, got under sail; but was soon obliged to come to an anchor a little above Motuara. Upon inquiring he learnt that there was a distant country, towards the north, called Ultima Thule; but he could not obtain any farther particulars. Lieutenant Cook, on the 6th of February, got out of the Sound, and in the evening saw two small islands, lying off "Cape Koamaroo," at the S.E. head of Queen Charlotte's Sound, and bearing E. at the distance of about four miles. The rapidity of the stream, occasioned by the tide of ebb, endangered the ship, and it was removed by some favourable incidents; the narrowest part of the strait through which it was rapidly driven, lies between "Cape Tic-

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\footnotesize{\textit{ante," on the coast of the island of Ekeinoanuoo, and "Cape Koamaroo," the distance between them being estimated at four or five leagues. During Mr. Cook's long and minute examination of the coast of New Zealand, he gave names to the bays, capes, promontories, islands, and rivers, and other places which he saw or visited, excepting in instances where their original appellations were learned from the natives. After having ascertained New Zealand to be an island, Mr. Cook wished to extend his acquaintance with the country. He completed his circumnavigation, by ranging from "Cape Tying-sen," southward along the eastern coast of Pocnamoo, round "Cape South," and back to the western entrance of the strait which he had passed, and which has been very properly called Cook's Strait; which see. In this range an island, lying about five leagues from the coast of Taw-Pocnamoo, was discovered, and it was named "Banks's Island." Lieutenant Cook, pursuing his course to the southward, wished to ascertain whether Pocnamoo was an island or a continent. In the prosecution of this object he passed some dangerous rocks on the 9th of March, and on the same day reached a point of land called "Swin Cape," in S. lat. 45° 19'. W. long. 132° 42', which proved to be the southern extremity of the country. On the 14th the Endeavour passed a small narrow opening in the land, where was a safe and convenient harbour, formed by the island, which lay eastward in the middle of the opening. On the land back of the opening are mountains, the summits of which were covered with snow, that had recently fallen. The land on each side of the entrance of the opening, rises almost perpendicularly from the sea to a stupendous height: and, on this account lieutenant Cook did not chuse to take the ship into the harbour. Before the 27th of March, the commander had circumnavigated the whole country of Taw-Pocnamoo, and arrived within ficht of the island before mentioned, lying nine leagues from the entrance into Queen Charlotte's Sound. With a view of obtaining a supply of water, he hauled round the island, and entered a bay, situated between that and Queen Charlotte's Sound, to which was given the name of Admiralty-bay; which see. Lieutenant Cook now directed his views towards Europe; and it was determined to return by the East Indies. In pursuance of this resolution, it was proposed that they should steer eastward till they should fall in with the east coast of New Holland, and then follow the direction of that coast towards the north, till they should arrive at its northern extremity. If that should be found impracticable, it was farther resolved that they should endeavour to fall in with the land, or islands, said to have been discovered by Quiros. For a farther account of New Zealand; see that article. On the 3rd of March our commandar sailed from "Cape Farewell" in New Zealand, S. lat. 40° 35'; W. long. 18°, and pursued his voyage towards the west. On the 15th of April "New Holland," or as it is now called, "N. W. South Wales," came in sight; and on the 28th, the ship anchored in Botany-bay; which see. During Mr. Cook's stay at this place, he caused the English colours to be displayed every day on shore, and took care that the ship's name, and the date of the year, should be inscribed on one of the trees near the watering-place. On the 6th of May our navigators failed from this bay; and in their farther progress lieutenant Cook gave the names marked upon the map to the bays, capes, points, and remarkable hills that appeared successively in sight. On the 14th, as the Endeavour advanced to the northward, being then in S. lat. 39° 25'; W. long. 266° 30', the land gradually rose in height, so that
that it may be called a hilly country. Between this latitude and Botany-bay, it exhibits a pleasing variety of ridges, hillocks, valleys, and plains, clothed with wood. On the 17th our navigators were in a bay called "Murton's bay," S. lat. 28° 36', W. long. 205° 28'; and from appearances they concluded that this bay opened into a river; but they had not then leisure to ascertain the fact. On the 22d, as they were purifying their voyage from "Harvey's bay," they discovered that the land was covered with palm nut-trees, which they had not seen from the time of their leaving the islands within the tropic. Early in the next day they went on shore, in order to examine the country, and found a channel leading into a large lagoon. Here they discovered a large river of fresh water, and room for a few ships to lie in great security. Near the lagoon grows the true Mangrove, as exisits in the West India islands, and the first of the kind that had been met with by our navigators. Among the islands and shoals they saw many large birds, which they judged to be pelicans, and on the shore a species of buffaloe of a considerable size and excellent food; so that in honour of it they called the inlet "Buffalo bay," S. lat. 24° 4', W. long. 205° 18'. Here they found a number of small pearl-oysters, among others of various kinds; so that Mr. Cook was of opinion, that an advantageous pearl-fishery might be established in this place. On the 26th our voyage, at a distance of one mile from the land, were abreast of the point which Mr. Cook found to lie directly under the tropic of Capricorn, in W. long. 28° 58', and he therefore called it "Cape Capricorn." On the 26th the ship, being under sail, was surrounded with islands, which lay at different distances from the main land; and here Mr. Banks, in fishing, took two sorts of crabs, such as had not been seen before; one of them was adorned with a bright blue band, equal to the ultramarine, which tinged all his claws and joints, while the under part was white and highly polished; the other was marked with ultramarine, more sparingly, on his joints and toes, and on his back were three brown spots of a singular appearance. Lieutenant Cook finding a passage between the islands, failed to the northward, and anchored at about two miles distance from the main. A great number of islands were within sight. Here Mr. Cook observing that the tide ebbed and flowed considerably, when the ship had anchored within the inlet, concluded that it was a river that might run pretty far up into the land. Our navigators having gratified their curiosity with a variety of objects, but being disappointed in their wishes of obtaining fresh water, determined to make a short stay in this place. Before they left it, however, they were drenched of more particularly examining the inlet, in which the ship lay; its breadth was found to be from two to five miles, upon a direction S. W. by S.; but here it opened every way, and formed a large lake, which to the N. W. communicated with the sea. On the south side of the lake was a ridge of hills; and various appearances indicated that the country was inhabited. The country, in general, in this part of New South Wales, appeared sandy and barren, and destitute of the accommodations which would fit it for being peopled by settled inhabitants. This inlet, from its want of fresh water, was called by Mr. Cook "Thirlby Sound." S. lat. 28° 22', W. long. 215° 19'. On the 31st our voyage, left the place and proceeded, till on the 7th of June they perceived on one of the islands, which they had been flying, the appearance of coconut-nut trees; but upon examination, there were mistaken for a small kind of cabbage-palm. On the 8th, when the Endeavour was in the midst of a cluster of small islands, the navigators discerned, with their glasses, upon one of the nearest of them, about 30 of the natives, men, women, and children, standing together and attentively looking at the ship. This was the first instance of curiosity that had been observed among the people of the country. They were wholly naked; their hair was short, and their complexion resembled that of the other inhabitants that had been before observed. In navigating the coast of New South Wales, for an extent of 22 degrees of latitude, or more than 1000 miles, lieutenant Cook had conducted his vessel in safety; but on the 20th of June, as he was purifying his course from a bay, which he had called "Trinity bay," the Endeavour fell into a situation peculiarly critical and dangerous; having been lifted over a ledge of rock, and living in a narrow inlet. The whole board were observed by the light of the moon to be floating away from her, and at last her false keel, to that moment it was expected the whole company would be swallowed up by the rushing in of the sea. The ship was expeditiously lightened as much as possible, and every exertion was made without murmur and with the greatest alacrity to escape the imminent peril to which their lives were exposed. So feebly were the sailors of the awfulness of their situation, that not an oath was heard among them. When morning dawned upon them they had a clearer view of their danger. Providentially, however, it became a dead calm, and high water came on at eleven in the morning: but it was necessary still further to lighten the ship, and two pumps were instantly worked to discharge the water that rushed in. For the tide at midnight they waited with anxious and anxious expectation: in the mean while the leak increased to a very alarming degree; and though the ship righted, it was expected that the sluice must go to the bottom as soon as she ceased to be supported by the rock. The floating of the ship, which in other circumstances, would have been the means of their salvation, was in their situation, a ground of serious alarm, because it might precipitate their destruction. Their possibility of escape was precarious, if the ship sunk; and the coast on which they were to be thrown, if any of them escaped, was inhabited by naked savages, from whom compassion they might derive no relief. The decisive moment at length arrived; and the ship was hove into deep water, without admitting more water than when she lay upon the shoal. The ship and crew experienced long hours of suffering from the weight of water, and the anxiety and fatigue, and in an exhausted state they threw themselves upon the deck, and after short intervals and pauses of rest, renewed their laborious and almost fruitless exertion for the leak gained upon the pumps. In this state of anxiety and labour, an accident occurred, which had almost terminated, at once, all their efforts. The planking which lines the ship's bottom is called the ciling; between which and the outside planking there is a space of about eighteen inches. From this ciling only, the man who had attended the well had taken the depth of the water, and had given the measure accordingly. But the peron, who relighted him, measured the depth to the outside planking, which had the appearance of the leak's having gained upon the pumps eighteen inches in a few minutes. The mistake, however, was soon detected; and this accident, at first so alarming, became, in the event, highly advantageous. New hopes, from a discovery that their situation was not so dangerous as they apprehended, inspired new vigour; and before eight in the morning the pumps gained considerably on the leak. At eleven o'clock the Endeavour was once more under full sail, and tolerably good for the land. They wished, however, to stop the leak; and Mr. Monkhouse, one of the midshipmen, proposed to the commander an expedient which had preferred a merchant ship, which had sprung a leak that admitted more than four feet water
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in an hour. This was called furling the ship. (See TOTHERING.)

The expedient succeeded; and it was owing partly to a fragment of rock, which had filled up one of the holes of the ship, that the ship did not sink and involve her whole company in inevitable destruction. In consequence of the difficulties experienced by the whole crew on this occasion, lieutenant Cook called a point in fight, which lay to the northward, in S. lat. 16° 6'. W. long. 214° 39', "Cape Tribulation." On the 14th a small harbour was discovered, excellently adapted for repairing the damage which the ship had sustained. Another alarming circumstance, which occurred at this time, was the access of the leaveny, that began to make its appearance among the ship's company, and that rendered it still more necessary to get on shore. On the 17th the ship put in for the harbour, the entrance of which was a narrow channel. Tents were erected for the accommodation of the sick; and all of them, except Mr. Green, manifested symptoms of recovery. On the 20th of June an emersion of Jupiter's first satellite was observed, from which they obtained the longitude of the place 214° 42' 36" W., its latitude being 15° 26' S. A plan of the harbour was taken; and Mr. Cook ascended a hill, from which he observed, to his great concern, innumerable sand-banks and shoals, lying in every direction of the coast. To the northward there was the appearance of a passage, by which lieutenant Cook had the only chance of getting clear, in the prosecution of his voyage. By a large supply of provisions, he was able to distribute 24 pounds to each man; a quantity of greens, being procured, were boiled with the peas; and by these means the ship's company obtained a very considerable refreshment. On the 2d of July our lieutenant entered the matter out of the harbour, to found about the shores; and to search for a passage to the northward. In a subsequent investigation, a passage to the sea was discovered between the shoals, which confided of coral rocks, and which had furnished cockles of an enormous size, infomuch that one of them was more than sufficient for two men. Other shells were also found in great abundance. At high water the ship floated; but a leak having been discovered, it was necessary to lay her afloat a second time. The several damages being repaired, the ship was again floated at high water, and preparations were made for proceeding on the voyage. To this harbour Mr. Cook gave the name of "Endeavour river." The matter, having been dispatched to re-examine the passage, which he had before discovered, reported that he had been mistaken. In the mean while, the inhabitants of the country, who had been very referred in holding any intercourse with the navigators, became more familiar, in consequence of the commander's prudent management. Here they discovered an animal, called by the natives kangooroo, which, being dexterous, proved to be excellent meat; and they were also furnished with great plenty of turtle, superior to any which the gentlemen ever tasted in England. The turtle was of the species called green turtle; and they weighed from two to three hundred pounds. The inward country was agreeably diversified by hills, valleys, and large plains, which in many places were richly covered with wood. The longitude of their situation, determined by an observation of the emersion of Jupiter's first satellite, July the 16th, was 214° 55' 45"; that on the 29th of June had given 214° 49' 30"; the mean of which was 214° 49' 7½" W. The Indians were very hostile and fraudulent; and so daring and insolent, that nothing would deter them but small shot repeatedly fired from the masts. In order to accommodate our navigators, they set fire to the grais, which blazed in various directions. On the 4th of August, after frequent unsuccessful attempts to disengage the ship from the harbour, she got under sail; but many difficulties occurred; and on the 5th, the lieutenant had not kept his course long before shoals were discovered in every quarter, which obliged him, at the approach of night, to come to an anchor. On the morning of the 10th, the weather, which had been boisterous, became more moderate, and the commander weighed anchor, and stood in for the land; determining to seek a passage along the shore to the northward. In pursuance of this resolution, the Endeavour proceeded in her course, and at noon came between the farthermost head-land that lay in sight, and three islands which were four or five leagues to the north of it, out at sea. Here they thought there was a clear opening before them, and began to hope that they were once more out of danger. In this hope, however, they were soon disappointed, and therefore the lieutenant gave the head-land, in 3° lat. 14° 56', W. long. 214° 47'; the name of "Cape Flattery." After flying for some time along the shore, for what was believed to be the open channel, an officer at the mast-head cried aloud that he saw land a-head, which extended quite round to the three islands; and that between the ship and them there was a large reef. Mr. Cook himself discovered the reef, but was of opinion that the supposed land was a cluster of small islands. In this state of uncertainty, however, he thought it most prudent to come to anchor, under a high point, from which he could have an extensive view of the sea and country. This eminence he called "Point Look-out." In the process of investigating the shoals and channel between them, the lieutenant, accompanied by Mr. Banks, discovered an island on which were no animals except lizards; and he therefore called it "Lizard island." In their return to the ship, they landed on a low sandy island, abounding with an incredible number of birds; and as they here found the nest of an eagle, they called it "Eagle island." At length, after much deliberation, it was resolved to quit the coast entirely, till they could approach it with less danger; and in pursuance of this resolution, the Endeavour, on the 13th, got under sail, and successfully passed through one of the channels or openings in the outer reef, which Mr. Cook had previously observed. The situation of our navigators was now happily changed; and after three months' anxiety and suspense, they found themselves in an open sea, with deep water. The passage or channel, through which the Endeavour passed into the open sea beyond the reef, lies in S. lat. 14° 52'. It is distinguished by the three high islands within it, to which, on account of the ufe they may be of in guiding the way of future voyagers, our commander gave the appellation of "Islands of Direction." New dangers, which created alarm and required fresh exertions, occurred; but every man did his duty with as much calmness and regularity as if no danger had been near. It was indeed the high and magnificent spirit of the commander, which inspired his people with such resolution and vigour. On the coast of a new and unknown country he proved all perils, and determined to ascertain whether this country did, or did not, join to New Guinea: a question which he had fixed upon resolving, from the first moment that he had come within sight of land. To the openings, through which he had passed with so much hazard, the commander, under a proper sense of gratitude to the Supreme Being, gave the name of "Proviudential channel." In the prosecution of the voyage, the navigators, on the 19th, were accompanied on every landfall, with rocks and shoals; but they were little moved, as perils had been familiar to them. On the 21st, as no land could be seen, they conceived hopes of having at last found a passage into the Indian sea; but to
determine this matter with greater certainty, lieutenant Cook resolved to land upon an island, which lies in the S.E. point of the passage. Accordingly he, accompanied by Mr. Banks and Dr. Solander, ascended a high hill, from which no land could be seen between the S.W. and W.S.W.; so that Mr. Cook had not the least doubt of finding a channel, through which he might pass to New Guinea. As he was now about to quit the coast of New Holland, which he had traced from lat. 38° to this place, and where he was certain no European had ever been before, he once more hoisted English colours, taking possession of the whole eastern coast, with all the bays, harbours, rivers, and islands situated upon it, from lat. 38° to lat. 10° S. in right of his majesty king George III., and by the name of New South Wales.

Having performed this ceremony upon the island, hence called "Pacification island," they relaunched in their boat; and on the 23d Mr. Cook was confirmed by several circumstances in his opinion, that he had arrived to the northern extremity of New Holland, and that to the westward he had an open sea. These circumstances afforded him peculiar satisfaction, not only because the dangers and fatigues of the voyage were drawing to a conclusion, but because it could no longer be doubted whether New Holland or New Guinea were two separate islands. The N.E. entrance of the third lies in S. lat. 15° 39', W. long. 218° 36'; and the passage is formed by the main land, and by a congeries of islands to the N.W., called by Mr. Cook the "Prince of Wales's islands," and which may probably extend as far as to New Guinea. To the channel through which he passed, he gave the name of "Endeavour straits."

From the coast of New South Wales, the lieutenant steered, on the 23d of August, for the coast of New Guinea; but in the progression of his voyage he fell upon a dangerous shoal, which exposed him to great danger; but he fortunately escaped; and on the 3d of September arrived within sight of New Guinea, and brought to within three or four miles of land. Some of the ship's company went on shore, but they were suddenly attacked by the natives, who had for some time concealed themselves in the woods. See New Guinea. Our voyagers leaving this coast, hallowed to the westward; and pursuiving their course, they discovered on the 6th of September a small island N.N.W.; and another low island, extending from that quarter to N.N.E. Unless these two islands belong to the "Arrau islands," they have no place in the charts; and if they do belong to these, they are laid down at too great a distance from New Guinea. Mr. Cook found the E. part of them in S. lat. 7° 6', W. long. 225°. On the 7th, when the ship was in S. lat. 6° 30', and W. long. 220° 34', our navigators ought to have been in the light of the Weaflile isles, which are laid down in the charts at the distance of 20 or 25 leagues from the coast of New Holland; but Mr. Cook, as he did not see them, concluded that they must have been laid down erroneously. In pursuiving their course, our navigators passed the islands of Timor, Timor-lavat, Rotte, and Seman. When they were near these latter islands they observed a phenomenon in the heavens, in some respects resembling, but in others differing from, the Aurora Borealis. Having passed all the islands between Timor and Java, lieutenant Cook did not expect to meet with any other in that quarter; but on the 17th he observed an island bearing W.S.W., which he thought to be a new discovery. When they came to the N. side of it, they saw hounes and cocou-nut trees, and numerous flocks of sheep. Here they landed; the commandr thinking he might thus supply the necessaries of the ship's company, and remove both the sicknes and the distress which had spread among them. This proved to be the island of Savu; which fee. On the 21st of September our navigators left Savu, and on the 1st of October came within sight of the island of Java; and on the 9th they stood in for Batavia road, where the Endeavour was secured from a stroke of lightning by the chain that was attached to it. The injurious effects of this climate were felt by our voyagers within nine days after their arrival; and Mr. Monkehoule, the surgeon of the ship, fell, on the 5th of November, the first sacrifice to this fatal country.

The repair of the Endeavour, which had been very much damaged, and which appeared to be in a very alarming state, was an object to which Mr. Cook, though himself affected by the climate, directed his particular attention, and it was performed much to his satisfaction. When this business was accomplished, on the 27th of December, the ship stood out to sea; and on the 4th of January 1771, came to an anchor under the S.E. side of "Prince's island," where the gentlemen of the ship, after having paid their respects to the king, commenced a traffic with the natives for turtles, tpows, fih, monkees, small deer, and vegetables. On the 5th the commander weighed, and stood out for sea. In the prosecution of the voyage to the Cape of Good Hope, the feeds of disease, which had been received at Batavia, appeared with very threatening symptoms, and reduced the navigators to a very melancholy situation. The ship was a mere hospital; the water taken in at Prince's island was purified with lime; and in order farther to guard against infection, the commander ordered all the parts of the vessel between the decks to be washed with vinegar. So fatal, notwithstanding every precaution, was the disease, that almost every night a dead body was committed to the sea. The losses amounted in all to 23 persons, besides the seven who died at Batavia. Among these were Mr. Green the astronomer, Mr. Parkinfon, natural history painter, Mr. Monkhous the midshipman, another midshipman, &c. &c. These calamitous events contributed most probably to turn the attention of Mr. Cook to those methods of preventing the health of seamen, which he afterwards pursued with such remarkable success. On the 13th of March the Endeavour arrived off the Cape of Good Hope; and a proper place was provided on shore for the accommodation and recovery of the sick. Lieutenant Cook having landed whilst the sick of his crew were recovered, necessary stores were procured, and the vessel refitted, till the 14th of April, stood out of the bay, and proceeded on his voyage westward.

In the morning of the 29th, he crossed his 6th meridian, having circumnavigated the globe in the direction from eft to west; the consequence of which was that he had lost a day, an allowance for which had been made at Batavia. On the 1st of May he arrived at St. Helena, and on the 4th he departed from this island, and pursued his course in safety. On the 11th of June, land, which proved to be the Lizard, was discovered; on the 11th the ship ran up the channel; next morning he passed Beachy head; and in the afternoon of the same day anchored in the Downs, and went on shore at Deal. Thus ended Mr. Cook's first voyage round the world, in which he had gone through so many dangers, explored so many countries, and exhibited the strongest proofs of his possessing an eminently sagacious and active mind; a mind that was equal to every perilous enterprise, and to the boldest and most successful efforts of navigation and discovery.

Mr. Cook having thus recommended himself to the protection of government, and the favour of his sovereign, was promoted in the progressive order of the naval service, to be a commander in his majesty's navy, Aug. 29, 1771.
an officer inferior in rank only, but equal in advantage to that of post-captain. On the 21st of May 1772, captain Cook communicated to the Royal Society by a letter to Dr. Markleyne, "An Account of the flowing of the Tides in the South Sea, &c." (see Phil. Trans. vol. lxxii. p. 357-8.) The curiosity of the public was much excited by the reports of lieutenant Cook's voyage; and it obtained amply gratified by Dr. Hawkeford's Account, in 3 vols. 4to. Extensive and interesting was the knowledge obtained in consequence of this voyage; but the question concerning a southern continent remained still undecided. The reign of our present sovereign George III. has been favourable to every kind of scientific and literary inquiry; and the earl of Sandwich, who, at the period to which we now refer, was at the head of the admiralty, was eminently capable of comprehending and disposed to encourage the most enlarged views and schemes with regard to navigation and discovery. By his particular recommendation, it was resolved to appoint a commission for determining the long disputed question relating to the existence of a southern continent. Quiros seems to have been the first person who ingrafted the idea of such a continent; but though he was sent out to ascertain it, he failed in the attempt. Mr. Dalrymple had now excited the public attention to this object, by his Historical Collection, in 2 vols. 4to. of the several voyages and discoveries in the south Pacific Ocean, 1770, 1771. When the Board of Admiralty determined to take up the business, captain Cook was immediately fixed upon as the person best qualified for conducting an enterprise which was to give the utmost possible extent to the geography of the globe, and the knowledge of navigation. Two ships, similar in construction to the Endeavour, were provided for this purpose; the largest of the two, which consisted of 442 tons burthen, was named the Resolution; and to the other, consisting of 336 tons burthen, was given the name of the Adventure. On the 28th of November 1771, captain Cook was appointed to the command of the former; and, about the same time, Mr. Tobias Furneaux was promoted to the command of the latter. The complement of the Resolution, in officers and men, was fixed at 112 persons, and that of the Adventure at 81. In the equipment of these ships, attention was directed to every circumstance that could contribute to the comfort and success of the voyage. Lord Sandwich was singularly attentive on the occasion; and both the navy and victualling boards took care to procure for the ships the best stores and provisions, together with an ample supply of antiscorbutic articles, such as malt, four krout, salted cabbage, portable broth, foup, mullard, marmalade of carrots, and infirminated juice of wort and beer. Scientific objects were also duly regarded. Mr. William Hodges, an excellent landscape painter, Mr. Reinhold Fohler, and his son, well informed in natural history, and Mr. William Wales, and Mr. William Bayley, skilful astronomers, were appointed to accompany the expedition; they were furnished with the best instruments for observation, and particularly with four time-pieces, three of Mr. Arnold's construction, and one of Mr. Kendall's, upon the principles of Mr. Harrison. Captain Cook, on board the Resolution, joined the Adventure in Plymouth Sound, on the 3d of July 1771, and there received his instructions, which comprehended, without entering into a minute detail, the most enlarged plan of discovery that is known in the history of navigation. He was instructed not only to circumnavigate the whole globe, but to circumnavigate it in high southern latitudes, making such traverses, from time to time, into every corner of the Pacific ocean not before examined, as might finally and effectually resolve the much agitated question about the existence of a southern continent, in any part of the southern hemisphere, to which access could be had, by the efforts of the boldest and most skilful navigators.

On the 17th of July, captain Cook sailed from Plymouth, and on the 26th anchored in Pencnhiwe road, in the island of Madeira. Having supplied himself with water, wine, and other necessaries, he left the island on Aug. 4th, and sailed to the southward. As he proceeded, he made three potches of beer, and infirminated several gallons of juice of malt, and the liquor was brilk and drinkable; though on account of the heat of the weather, and the agitation of the ship, the juice was in a high state of fermentation. If it could be kept from fermenting, this would be a most valuable article at sea. At St. Jago, one of the Cape de Verd islands, he stopped to procure a fresh supply of water. On the 20th of the month, they were delayed with rain; but to guard against the pernicious effects of rain on any future occasion, captain Cook took care to well air and dry the ship with fires between the decks, and to smock its damp places; besides, the people were ordered to air their bedding, and to wash and dry their cloaths, whenever they had an opportunity; such was the result of these precautions, that there was not one sick person on board the Resolution. On the 8th of September, the ship crossed the line in W. long. 83°, and proceeded on its voyage. On the 29th, being near the Cape of Good Hope, the whole sea, as far as our voyagers could see, became at once, as it were, illuminated. In order to ascertain the true cause of this phenomenon, which had in the former voyage been attributed to luminous insects, captain Cook examined some buckets of water, and found in them a number of globular insects, about the size of a common pin's head, and quite transparent. Mr. R. Forster was satisfied that these were the cause of the sea's illumination. On the 30th, the Resolution and Adventure anchored in Table bay; and the captains on going on-shore, were received by the governor with great politeness. On the 22d of November, our commander failed from the Cape, and professed his voyage in search of a southern continent. He directed his course for Cape Circumcision; but, by tempestuous weather, our voyagers were driven far to the eastward of their intended course, being in S. lat. 48° 41' E. long. 18° 24', so that they had no hopes of reaching this Cape. In this gale, they had the misfortune to lose the principal part of the live stock on board, consisting of sheep, hogs, and geese.

On the 10th of December, in S. lat. 50° 40', and long. 2° E. of the Cape of Good Hope, they began to meet with islands of ice, one of which was judged by captain Cook to be about 50 feet high, and half a mile in circuit. The weather was hazy, and danger was imminent. On the 18th they happily got clear of the field of ice. They were now in S. lat. 55° 9', and long. 24° 5'. An opinion had been entertained, that such ice was formed in bays and rivers, and hence our voyagers were led to conclude, that land was not far distant. But they proceeded without finding it. The whole crew began to complain much of cold, and therefore the captain directed the fleeces of their jackets to be lengthened with baize, and ordered a cap to be made for each, strengthened with canvas. This frosting, it should be recollected, was with them the middle of summer. As some of the crew appeared to have symptoms of the scurvy, fresh wort was given them every day. By the 29th, the commander was satisfied that the field of ice, along which the ships had failed, did not join to any land. Determining to run as far W. as the meridian of Cape Circumcision, a gale sprang up on the 31st, which brought with it such a swell

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After our navigators had been on the lookout for the ice for some time, they had observed it but once, and it was the last of the season which they had observed. It consisted of fluffy, white, frozen drift and was blown on land by the wind. The ice was not thick, but it was a good deal thicker than the ice which had been observed before, and it was not as extensive as the ice which had been observed in the previous years.

On the 18th of January, they were at the Cape of Good Hope, and it was there that they had their first sight of the ice. The ice was seen in the distance, but it was not as extensive as the ice which had been observed before. The ice was not as thick, but it was a good deal thicker than the ice which had been observed in the previous years.

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gave orders that they should be boiled, with wheat and portable broth, every day for breakfast, and with peas and broth for dinner. Experience had taught him that these vegetables, thus dressed, are very beneficial to scaven, in removing various scrobutic complaints. The intercourse with the natives of the country was of a friendly nature; and proved advantageous in a variety of respects, particularly in supplying a quantity of fish. On the 2d of June, when the ships were almost ready to put to sea, captain Cook sent on shore a male and female goat; and captain Furneaux left at Cannibal cove, two breeding fowls, and a boar. It is a remarkable circumstance, that during captain Cook’s second visit to Charlotte Sound, he could not recollect the face of any one person he had seen three years before, nor did it appear that a single Indian had any knowledge of him. Hence he infers, that in the interval the natives had either been driven away, or had removed, of their own accord, to some other situation. Not one-third of the inhabitants, formerly observed, seemed to be now there; their strong hold on the point of Matouria was deserted, and in every part of the Sound many forsaken habitations were discovered.

In the captain’s opinion, the place had never been very populous. From comparing the two voyages, it appears that the Indians of Eaheni-nouaue are in some sort of a more improved state of society than those of Tavai-poennamno. During captain Cook’s stay in the Sound, he had observed that the second visit to this country had not mended the morals of the natives of either sex. He had always looked upon the females of New Zealand as more chaste than the generality of Indian women. But he was now told, that the male Indians were the chief promoters of a shameful traffic, and that, for a slipper-mall, or any other thing they valued, they would oblige the women to prostitute themselves, whether it was agreeable or contrary to their inclination. At the same time, no regard was paid to the privacy which decency required. The account of this fact must be read with concern by every well-wisher to the good order and happiness of society, even without advertizing to considerations of a higher nature. On the 7th of June captain Cook put to sea from Queen Charlotte’s Sound together with the Adventure; and on the 1st of August, when they were in S. lat. 25° 14′, and W. long. 134° 6′, they were nearly in the situation assigned by captain Carteret for “Pitcairn’s island,” discovered by him in 1767; but they did not observe it. As our commander advanced in his course, every circumstance concerted to convince him that between the meridian of America and New Zealand there is no southern continent; and that there is no continent farther to the south unifies in a very high latitude. But the investigation and decision of the fact were referred for the employment of the ensuing summer. It was the 6th of August before the ships had the advantage of the trade wind; which they got at S.E. in S. lat. 19° 36′ W. long. 135° 32′. Having obtained this wind, captain Cook directed his course to the W.N.W. and proceeded in the track, pursued by M. de Bougainville. To four of the islands which he passed, he gave the names of “Resolution island,” “Doubtful island,” “Furneaux island,” and “Adventure island,” which see respectively. These are supposed to be the same that were seen by M. de Bougainville; and they, with several others, constitute a cluster of low and half-drowned isles, which that gentleman distinguished by the name of the Dangerous Archipelago. On the 15th of August the ships came within sight of “Osnaburg island,” or Maitaca, which had been discovered by captain Wallis. Having escaped being wrecked on the coast of Otaheite, they anchored, on the 17th, in Oatiippia bay, near the S.E. end of the island; and they were immediately crowded with the inhabitants of the country, who brought with them cocoa-nuts, plantains, bananas, apples, yams, and other roots, which were exchanged for nats and beads. On the 24th the ships put to sea, and arrived the next evening in Matavai-bay; but before they could come to anchor, the decks were crowded by the natives, many of whom were known to captain Cook or by most of whom he was well remembered. At Oparree the tents and astronomer’s observatories remained, on the same spot from which the transit of Venus had been observed in 1769. As soon as the frigate was recovered, the water completed, and the necessary repairs of the ships finished, captain Cook determined to put to sea, and on the 18th of September he ordered the vessels to be unmoored. In the mean while lieutenant Pickett returned from Atahsurau, where he had been to procure hogs; and in this expedition he had seen Oheere, in a very humble situation, compared with that which she had formerly occupied. In the evening of this day a favourable wind having sprung up, the commander put to sea; on which occasion he dismissed his Otaheite friends sooner than they wished to depart; but well satisfied with his kind and liberal treatment. From Matavai captain Cook directed his course for the island Huahine; this he reached the next day, and on the 3d of September anchored in the harbour of Owharre. Both the captains landed upon the island, and being cordially received by the natives, commenced a trade with them. Every thing was conducted with mutual confidence and harmony till the 6th, when several circumstances occurred on the part of the natives, which interrupted the friendly intercourse. Captain Cook at length complained to Oro, the king, of their insolence and frauds, who was much concerned on the occasion; and expected himself to obtain redress and to punish the delinquents. It was from the island Huahine that captain Furneaux received into his ship a young man named Omai, a native of Uliet, of whom so much hath since been known and written. This choice was at first disapproved by captain Cook, who thought that this youth was not a proper sample of the inhabitants of the Society islands; being inferior to many of them in birth and acquired rank, and not having any peculiar advantage with respect to shape, figure, or complexion. The captain afterwards found reason to be better satisfied with Omai’s having accompanied our navigators to England. At Huahine the vessels, though their stay was short, obtained very plentiful supplies of provisions. Not less than 300 hogs, besides fowls and fruit, were procured. From Huahine our navigators sailed for Ulietea, where trade was carried on in the usual manner, and a most friendly intercourse renewed between captain Cook and Oro, the chief of the island. An interruption took place in the intercourse between the ships and the natives, which was occasioned by a misapprehension on the part of the latter, and which upon proper explanation was soon rectified. So that provisions were furnished at Ulietea no less plentifully than at Huahine. Captain Cook estimated that the number of hogs, which had been obtained, amounted to 400 or upwards. Our commander, by his second visit to the Society islands, gained a farther knowledge of their general state and of the customs of the inhabitants. With regard to a certain disorder, captain Cook was not able to determine whether it was known to the islanders before they were visited by the Europeans; but he found upon inquiry that the introduction of it, if of recent origin, was unanimously ascribed to the voyage of M. de Bougainville.
village. Captain Cook wished to satisfy himself, whether human sacrifices constituted a part of the religious customs of these people. From Omai he afterwards learned that the inhabitants of the Society islands offer human sacrifices to the Supreme Being. The knowledge he was able to obtain concerning their religion was very defective. With regard to the character of their women, he was enabled to rectify a prevailing error; and he does them justice by informing us, that the favours both of the married women and of the unmarried, of the better sort, were as difficult to be obtained in the Society islands as in any other country. And as to the unmarried females of the lower classes, there were many who would not admit of any indecent familiarities. This voyage enabled our commander to gain some further knowledge concerning the geography of the Society islands; and he found it highly probable, that Otaheite is of greater extent than he had computed it in his former estimation. On the 17th of September captain Cook failed from Ulietea, directing his course to the west, with an inclination to the south. Land was discovered on the 23d, to which he gave the name of "Harvey's island." S. lat. 10° 7'. W. long. 158° 49'. On the 1st of October he reached the "island of Middelburg." From Middelburg the ship failed to "Amsterdam," the natives of which island were no less disposed than those of the former to maintain a friendly intercourse with the English. A few old rags at this island were sufficient for the purchase of a pig or a fowl.

Although the natives of Amsterdam were of a friendly disposition, they were not entirely free from the thievish propensity which pertained to the islanders of the Southern Ocean. The two islands of Middleburg and Amsterdam are guarded from the sea by a reef of coral rocks, extending from the shore about 100 fathoms. Similar to this, in a great measure, is the situation of all the tropical islands which our commander had seen in that part of the globe; and hence arises an evidence of the wisdom and goodfaith of Providence; as by such a provision nature has effectually secured them from the encroachments of the sea, though many of them are mere points, when compared with the vast ocean by which they are surrounded. The two islands above-mentioned are situated between the lat. of 21° 39' and 21° 53' S., and between the long. of 175° 40' and 175° 15', W. of S. lat. 5° 27', and W. long. 142° 39', S. lat. 3° 35', and W. long. 150° 53'.

On the 5th of October captain Cook proceeded on his voyage; next day he pilot'd the "island of Piliat, discovered by Tasaram, and situated in S. lat. 22° 26'. W. long. 175° 59'. On the 21st he made the land of New Zealand, at the distance of 8 or 10 leagues from Table cape. To a chief, who came off in a canoe, he gave two boars, two fows, four hens, and two cocks, and a quantity of feeds, of wheat, French and kidney beans, peas, cabbage, turnips, onions, carrots, parsnips, and yams. On the 30th of November the Resolution was brought into Ship Cove, in Queen Charlotte's Sound. After his arrival, the first object of the captain was to provide for the repair of his ship, and the next to examine into the state of his bread, much of which had become unfit for use. To the inhabitants, who refided at the Cove, he gave a boar, a young fow, two cocks, and two hens, which he had brought from the Society Islands; and at the bottom of the well bay he ordered to be landed three fows and a boar, together with two cocks and two hens; together with as much food as would last them 10 or 12 days. In the second visit of our navigators to New Zealand, they met with indubitable evidence that the inhabitants were eaters of human flesh; but it was captain Cook's firm opinion, that the only flesh that was eaten by these people was that of their enemies who had been slain in battle. Our commander did not leave New Zealand without making such remarks on the coast between Cape Terawhitre and Cape Palliser, as may be of use to future navigators. As the Adventure had been separated from the Resolution, and was thought to be no where upon the island, captain Cook gave up all hopes of seeing her any more during the voyage. On the 26th of November the captain failed from New Zealand, in search of a continent, and steered to the south, inclining to the east. Some days afterwards, our navigators reckoned themselves to be antipodes to their friends in London, and consequently as at great a distance from them as possible. The first ice island which they saw, was on the 11th of December, in S. lat. 6° 10'. W. long. 175°. In the process of the voyage such islands continually occurred, and the navigation became daily more difficult and dangerous. In S. lat. 6° 5', our voyagers at last got within such a cluster of these islands, and of loose pieces, that they found it almost impossible to escape. However, being relieved, the Resolution, on the 22d of the month, was in the highest latitude she had yet reached, with 67° 5', W. long. 142° 54'. and circumstances became too unfavourable, that captain Cook determined to return towards the north. Here was no probability of finding land, or of a possibility of getting farther south. As our navigators advanced to the N.E., on the 24th, the ice-islands increased very much upon them; and in the midst of about 100, they spent Christmas day. As captain Cook, agreeably to his late resolution, had traversed a large extent of ocean, without seeing land, he again directed his course towards the south; and by the 30th of January, 1774, after encountering innumerable obstructions, he reached to S. lat. 71° 10'. W. long. 160° 54'. Farther it would have been extreme folly to have proceeded. The captain was of opinion, in which most of the gentlemen on board concurred, that the ice now in sight extended quite to the pole, or might join to some land, to which it might have been fixed from the earliest time. Compelled at last by inevitable necessity to tack, and to land towards the north, captain Cook formed a resolution of spending the ensuing winter within the tropic. He was well satisfied, that no continent was to be found in this ocean, but that which must lie so far north as to be wholly inaccessible, on account of ice. If a continent existed in the Southern Pacific Ocean, he was sensible that he must have the whole summer before him, in order to explore it. Upon the supposition, that no land could be found, he might reach the Cape of Good Hope by April; in that case he would have finisht the business of finding a continent, which was indeed the first object of the voyage. But this could not satisfy the comprehensive and magnanimous mind of our commander. He had a good ship, expressly sent out on discoveries, a healthy crew, and wanted neither stores nor provisions. In such circumstances, to have quitted this Southern Pacific Ocean would have been betraying, as he thought, not only a want of perseverance, but of judgment, in supposing it to have been so well explored, that nothing farther could be done. Although he had proved that, if there were a continent, it must lie far to the south, there remained room for very large islands, in places as yet unexamined. He was also persuaded, that his continuing for some time longer in this sea would be serviceable to geography and navigation, and other sciences. Thus he reasoned; and accordingly it was his intention first to go in search of the land, said to have been discovered by Juan Fernandez, in the last century, in about the lat. of 38°; and if he failed in finding this land, he proposed to direct his course in quest of "Easter Island," or "Davis's land." He next intended to go within the tropic, and
and proceed seaward till he arrived at Otaheite, where it was necessary for him to explore the Adventure. It was also in his contemplation to run as far west as the "Terra Australis." He had proposed to steer to the south, and so back to the east, between the latitudes of 50° and 63°. In the execution of this plan, it was his purpose to attain the length of Cape Horn, in the ensuing November, when he should have the best part of the summer before him, to explore the southern part of the Atlantic Ocean. When he communicated this extensive plan, comprehending hazards and difficulties without number, to his officers, they unanimously and cheerfully concurred. In pursuance of his course to the north, Captain Cook became allured that the discovery of Juan Fernandez, if any such was ever made, could be nothing more than a small island. Our captain was at this time confined to his bed by a bilious colic: by the attention of Mr. Patten, the surgeon, he was relieved, and at length the disorder subsided; but his stomach was so weak, that he could take nothing but the broth and flees of a favourite dog, belonging to Mr. Forster. On the 11th of March our navigators came within sight of "Easter island," or "Davis's land." In S. lat. 25° 5' 30", W. long. 150° 46' 20". On the 6th and 7th of April they came within sight of four islands, which they knew to be the "Marquesas." To one of them Captain Cook gave the name of "Hood's island," and as soon as the ship was brought to an anchor in Madre de Dios, or Resolution bay, in the island of "Chritina," a traffic commenced, in the course of which the natives would frequently keep the goods, without making any return. Theft was so common, that it was impossible to guard against it; and one of the thieves was accidentally killed by a shot, in the act of stealing. After some time the trade was carried on in a better manner; and the ship was supplied with yams, plantains, bread-fruit, a few cocoanuts, fowls, and small pigs. From the Marquesas Captain Cook steered for Otaheite, with a view of falling in with some of the islands discovered by former navigators, and especially by the Dutch, the situation of which had not been accurately determined. In the course of the voyage he passed a number of low islets, connected together by reefs of coral rocks. One of these islands was "Tinokera," discovered and visited by Byron. Besides passing by "St. George's islands," so named by Captain Byron, Captain Cook discovered four others, which he called "Palliser's islets." On the 22d he anchored in Matavai bay, at Otaheite, where he took measures for the repairs of the ship. During his stay at Otaheite, he maintained a most friendly connection with the inhabitants; and a continual interchange of visits took place between him and Otoo, Towka, and other chiefs of the island. On the 15th of May, our captain anchored in Owharre harbour, in the island of Huahine, where he procured bread-fruit, cocoanuts, and other vegetables in abundance; but there was a scarcity of hogs. When they were leaving the island, the good old chief, Oreo, was the last man that left the vessel. At parting, Captain Cook told him that they should meet each other no more: Oreo wept, and said, "let your sons come, we will treat them well." At Ulieta nothing particular occurred. It was the last request of Oreo, the chief, to Captain Cook, that he would return; and when he could not obtain a promise to that effect, he asked the name of his burying place. Oreo's anguish at parting was very great: "he looked up at the ship, burst into tears, and then sunk down into the canoe." On the 6th of June, our voyagers left Ulieta, they few land, which they found to be a low reef island, about four leagues in compass, and of a circular form. called "Uawe island," discovered by Captain Wallis, and situated in S. lat. 16° 46', W. long. 154° 37'. Another reef island was seen on the 16th, to which Captain Cook gave the name of "Palmerston island," in S. lat. 18° 34', W. long. 165° 10'. On the 20th land was again seen, called by captain Cook "Savage island," in S. lat. 19° 4', W. long. 169° 37'. Pursuing his course to the W.S.W., Captain Cook sailed by a number of small islands, and on the 26th anchored on the north side of "Anamoona," or "Rotterdam," in S. lat. 25° 15', W. long. 174° 31'. While the captain was on shore at this island, he got the names of 20 islands which lie between the N.W. and N.E.; but two of them are most remarkable on account of their great height, viz. "Amataytanoa," and "Ogian." From the N.W. to the S. of Rotterdam, round by the E. and N., it is encompassed by many small islets, sand-banks, and breakers: no termination of them could be seen to the N., and they may possibly reach as far S. as Amsterdam, or Tongataboo. Together with Middleburg or Enoure and Pitart, these form a group, containing about three degrees of latitude and two of longitude; and Captain Cook called them the "Friendly islands," or "Achipelago." Pursuing his course to the west, our navigators discovered land on the 18th of July, which they found to be a small island, to which Captain Cook gave the name of "Turtle island," on account of the number of turtle which were seen on the coast. On the 18th high land was seen to the S.W., which was the "Australis del" Epiritu Santo of Quiros, or the Great Cyclades of M. de Bougainville. After exploring the coast for some days, the captain anchored in a harbour of the island of "Malicello," which he called "Port Sandwich," situated on the N.E. side of the island, not far from the S.E. end, in S. lat. 16° 25' 20", E. long. 165° 57' 23". On the 23d of July our navigators, having gotten to sea, discovered three or four small islands; and at this time the Resolution was not far from the "isle of Ambrym," the "isle of Paoam," and the "isle of Apoe," the S.E. of which latter island was discovered a group, which Captain Cook called "Shepherd's isles." Amidst the number of islands now observed, one only appeared to be uninhabited: it consisted of a remarkable peaked rock, accessible only to birds, and obtained the name of the "Monument." In the farther course of the ship to the southward, our navigators approached other islands, which they found to consist of one large island, and three or four smaller ones. The two principal of the latter were called "Montague," and "Hinchinbrook," and the large island captain Cook named "Sandwich," in honour of his patron, the earl of Sandwich. Pursuing his discoveries, he came to an island, called by the natives "Erromangyu," in a bay of which he anchored. As the inhabitants behaved treacherously, captain Cook called a promontory, or peninsula, near which a skirmish happened, "Traitor's Head," in S. lat. 18° 43', E. long. 169° 28'. From this place the captain sailed for an island, before discovered, on which he proposed to make some stay, for the purpose of obtaining a supply of wood and water. This island was called "Tanna," and three others near it were distinguished by the names of "Immer," "Errona," or "Footooana," and "Annatom." The harbour in which he anchored was called by him "Port Resolution," after the name of the ship; it was situated in S. lat. 19° 3' 25", and E. long. 167° 44' 35'. To this Archipelago, or group of islands, which captain Cook particularly examined, he gave the name of "New Hebrides." The season of the year came on when captain Cook proposed to return towards the north; but he improved the intervening time in exploring any land which he might yet meet with between the New Hebrides.
Hebrides and New Zealand, at which place it was his intention to refresh his people, and to renew his stock of wood and water for another southern course. Sailing with this view, September the 1st, he discovered land on the 4th; and the Resolution anchored next day in a harbour belonging to it. The inhabitants behaved to him in a very civil and friendly manner; and he returned their kindness with presents to their chief. Captain Cook gave this island the name of "New Caledonia." On one of the small adjoining islands the captain found a species of spruce pine, of which spars and very good masts might be made, and called it the "Isle of Pines." To another, which afforded ample employment to the botanists, he gave the name of "Botany Island." The captain, before he left this island, was enabled to far to survey it as to ascertain, that, excepting New Zealand, it is probably the largest island in the South Pacific ocean. Another island was observed of good height, and five leagues in circuit, to which was given the name of "Norfolk Isle," in S. lat. 29° 29' 30" E. long. 168° 16'. On the 6th of October our captain anchored in Ship Cove, in Queen Charlotte's Sound, on the coast of New Zealand; and his journal states that the inhabitants was altogether peaceful and friendly. Mr. Wales, on this occasion, accurately ascertained the latitude and longitude of this island, and found the bottom of Ship Cove to be in S. lat. 41° 5' 56" W., and E. long. 174° 25' 34". The 10th of November captain Cook left New Zealand, in the prosecution of his great object, or the determination of the question concerning the existence of a southern continent. Having failed in different latitudes, extending from 35° to 55° 48' S., till the 27th, the ship being in W. long. 138° 56', he gave up all hopes of finding any more land in this ocean. He therefore resolved to bear directly for the west entrance of the straits of Magallanes, with a view of coasting the S. side of Terra del Fuego, round Cape Horn, to the Strait of Le Maire. In the prosecution of this voyage, on the 17th of December, he reached the W. coast of Terra del Fuego, and on the 20th anchored in a place to which he gave the name of "Chirnisms Sound." The whole coast and country were defolate and uninteresting. Near every harbour, however, fresh water and wood for fuel were obtained. The country also abounded with wild fowl, and particularly geese. See Chirnisms Sound, and Terra del Fuego. On the 28th, captain Cook left Chirnisms Sound, and proceeded round Cape Horn, through Strait of Le Maire, to Staten land. Having passed this famous Cape on the next day, he entered the Bay of the Pacific Ocean, which he entered. On Staten island he found a port, on the 25th of January, which, from this circumstance, was denominated "New Year's Harbour." In the small islands adjacent to Staten land, and called "New Year's Isles," captain Cook perceived a harmony between the different animals of the place, which he thought deferving of being recorded. He feared, as far as they had entered into a league not to disturb each other's tranquillity. The greater part of the sea coast is occupied by the sea-lions; the sea-bears take up their abode in the ile; the flags are planted on the highest cliffs; the penguins fix their quarter where they have the most ready communication with the sea; and the rest of the birds chuse the most retired places. All these animals were occasionally seen to mix together like domestic cattle and poultry in a farm yard, without any attempt on the part of one to molest the other. Nay, the captain had often observed the eagles and vultures sitting on the hills among the flags, while none of the latter, whether old or young, appeared to be in the least disturbed at their presence. Should it be asked, how do these birds of prey live? The captain answers the question, by supposing, that they feed on the carcasses of seals and birds, which perish by various causes. It is probable, from the immense quantity of animals with which the island abounds, that such carcasses exist in great numbers. On the 4th of January, captain Cook sailed from Staten island, in order to reconnoitre that extensive coast laid down by Mr. Dalrymple in his chart, which is the gulf of St. Sebastian. As he had some doubt of the existence of such a coast, he determined to make the western point of the gulf; but when he came to the different points of it, he could discover neither land nor any unquie vocal signs of it. Proceeding in his voyage, land was seen on the 14th, but being almost wholly covered with snow, it was at first mistaken for an island of ice. This was named from its first observer, "Willis's island," S. lat. 54° W. long. 38° 33'. Another larger island, on which was a very considerable number of birds, was called "Bird island." On the 17th captain Cook landed in a bay of an extensive tract of country, very defolate in its appearance, which he took possession of in his majesty's name. The bay, situated in S. lat. 54° 5' W. long. 33° 48', he called "Pollock Sound," and the country, which proved to be an island 53 leagues in circuit, was called the "isle of Georgia," situated between 53° 57', and 55° 57' S. lat., and 13° 13', and 13° 34 W. long. On the 27th captain Cook, having left Georgia the 25th, computed that he was in S. lat. 63° 6'. Here he was satisfied there could be no land in the direction towards the W., from which there was a long hollow swell; and hence he inferred, that the extensive coast laid down in Mr. Dalrymple's chart of the ocean between Africa and America, and the gulf of St. Sebastian, did not exist. An elevated coast, observed on the 5th, was called the "Southern Whale," S. lat. 57° 13' 30', W. long. 27° 45'. To the more distinguished tracts of country, discovered from Jan. 31st to Feb. 6th, captain Cook gave the names of "Cape Bridel," "Cape Montau," "Saunders's ile," "Candelmas Illes," and "Sandwich's land." The last is either a group of islands, or a point of the continent; for the captain was firmly of opinion, that a considerable tract of land existed near the pole, which was the source of most of the ice that is spread over this vall southern ocean. He thought it probable that this land might extend farther to the N., where it is opposite to the southern Atlantic and Indian oceans. Ice had always been found by him farther to the north in these oceans than anywhere else, and this he judged could not be the case if there were not land of considerable extent to the south. See Southern Continent.

Captain Cook having accomplished the great object of his navigation round the globe, began to direct his views towards England. Many circumstances relating to the state of his provisions, and the health of his crew, contributed to hasten his return. In his course to the Cape of Good Hope, he searched for the islands of "Diana" and "Marieven," laid down in Halley's variation chart, in S. lat. 41° 30', and about 4° of longitude E. of the meridian of the Cape of Good Hope; but after sailing from February 25th to March 13th, no such islands could be discovered. On the 22d of March he anchored in Table bay; having failed from the time of leaving the Cape of Good Hope, to his return thither, no less than 20,000 leagues, which was an extent of voyage nearly equal to three times the equatorial circumference of the earth. It could not therefore be surprising, that the rigging and sails of the Resolution should be essentially damaged, and even worn out; and yet in the whole of this run, made in every latitude between 50° and 71° S., she did not spring either low-mast, top-mast, lower or top-sail yard; nor did she make as much as break a lower or top-mast yard;
COOK.

through; these happy circumstances were owing to the good properties of the vessel, and the singular care and abilities of her officers. Captain Cook having completed the necessary repairs, and supplied himself with requisite stores and provisions, left the Cape on the 27th of April, and reached the island of St. Helena on the 15th of May; on the 28th he anchored on the island of Ascension, and arrived at the island of Fernando de Noronha, on the 9th of June. In the progress of the voyage, he made an experiment upon the fill for procuring fresh water; the result of which was, that the invention is useful upon the whole, but that it would by no means be advisable to trust to it entirely; more especially as captain Cook was convinced, that nothing contributes more to the health of seamen, than a plentiful supply of water. On the 16th of July, the captain anchored in the bay of Fuyal, one of the Azores islands; and on the 19th, proceeded with all expedition for England. On the 30th, he anchored at Spithead, and landed at Portsmouth; having been absent from Great Britain three years and 18 days, during which time, and all changes of climate, he had lost but four men, and only one of them by fickness. The able manner in which captain Cook had conducted this voyage, and the discoveries he had made, could not fail to recommend him to the protection and encouragement of those who had patronized the undertaking. The noble lord who had taken a lead in the plans of navigation and discovery, was still at the head of the admiralty-board; and recommended by him to his majesty, our navigator was raised, on the 9th of August, to the rank of a post-captain, and three days after, appointed a captain in Greenwich hospital; a situation which was intended to afford him a pleasing and honourable reward for his illustrious labours and services. Moreover, so important were his discoveries to science in general, that on the 24th of February 1776, he was unanimously chosen a member of the Royal Society; and on the evening of the 7th of March, when he was admitted, a paper was read containing an account of the method he had taken to preserve the health of the seamen. (See Philos. Tran. vol. LXV. p. 402—406.) Another paper was communicated, at the request of the president, Mr. John Pringle, on the 18th of April, relative to the tides in the South Sea, viz. those in the Endeavour river, on the east coast of New Holland. (See Phil. Trans. ibid. p. 447, &c.) It was also resolved by the president and council to bestow on captain Cook Sir Godfrey Copley's gold medal. The president, according to his custom, delivered an elaborate discourse on the subject of the paper, which was thus distinguished.

The particulars of this voyage were related by captain Cook himself, in a manner that redounds to his reputation as a writer. His style is natural, clear, and manly; being well adapted to the subject and to his own character. The superintendence of the publication was undertaken by his learned and valuable friend, Dr. Douglas, who lately died in the se of Saltibury, and whose promotion afforded pleasure to per sons of literature of every denomination. The history of the voyage was recommended to the public by the accuracy and excellence of its charts, and by a great variety of engravings from the curious and beautiful drawings of Mr. Hodges. It was followed by the publication of the original astronomical observations, which had been made by Mr. Wales in the Resolution, and Mr. Bayley in the Adventure.

The illusion of a "Terra Australis incognita" to any purposes of commerce, colonization, and utility, having been dispelled; another geographical question of very general interest remained to be determined; and that was the practicality of a northern passage to the Pacific ocean. Many persons had conceived that there was a shorter, a more commodious, and a more profitable course of falling to Japan and China, and, indeed, to the East Indies in general, than by the tedious circuit of the Cape of Good Hope. To find a westerly passage round North America had been attempted by several bold navigators from Filibisher's first voyage, in 1576, to those of James and of Fox, in 1633. By these expeditions a considerable reflection was made to the knowledge of the northern extent of America, and Hudson's and Baffin's bays were discovered. But the westerly passage, on that side, into the Pacific ocean, was still unattained. Nor were the various attempts of our countrymen, and of the Dutch, to find such a passage, by falling round the north of Asia, in an eastern direction, attended with better success. Wood's failure in 1676, seems to have terminated the long list of unfortunate expeditions in that century. The discovery had ceased for many years to be an object of pursuit. However, the question was revived in the last century. Accordingly captain Middleton was sent out by government in 1741, and captains Smith and Moore in 1745. But, though an act of parliament had been passed, enacting a reward of $20,000 to the discovery of a passage, the accomplishment of their favourite object still remained to be effected. Previously to the full execution of this design, lord Mulgrave fell with two ships, in order to determine how far navigation was practicable towards the north-pole. In this expedition his lordship encountered many difficulties. Nevertheless, the expectation of opening a communication between the Pacific and Atlantic ocean, by a northerly course, was not abandoned; and it was resolved that a voyage should be undertaken for that purpose. Captain Cook was instantly, and unanimously, thought to be in every respect the proper person to accomplish this difficult and hazardous, but very important and interesting object. He had, however, done so much, and undergone so many trials, that his most zealous friends, and those who were most ardently devoted to the object, could not think of asking him to engage in fresh perils; the undertaking, however, became a subject of congratulation when he became a subject of congratulation when he visited the table of lord Sandwich, when captain Cook was present. The object, with all the interests connected with it, excited the ardour of the captain's mind, and he offered to undertake the direction of the enterprise. The Earl of Sandwich lost no time; the matter was laid before the king; and captain Cook was appointed to the command of the expedition, Feb. 10, 1776. At the same time, it was agreed, that, on his return to England, he should be restored to his situation at Greenwich; and, if no vacancy occurred during the interval, the officer who succeeded him was to resign in his favour. All former navigators round the globe had returned to Europe by the Cape of Good Hope; but captain Cook undertook to accomplish the arduous task by reaching the high northern latitudes between Asia and America; and it is thought that the captain's own reflections on the subject suggested this plan. Instead, therefore, of a passage from the Atlantic to the Pacific, one from the latter into the former was to be tried. Accordingly captain Cook was ordered to proceed into the Pacific ocean, through the chain of new islands, which had been visited by him in the southern tropic. After having crossed the equator into the northern parts of that ocean, he was to hold such a course as might probably fix many interesting points in geography, and produce intermediate discoveries. With regard to his grand object, it was determined, after the most mature deliberation and inquiry, that.
that, upon his arrival on the coast of New Albion, he should proceed northward as far as the latitude of 65°, and not lose any time in exploring rivers or inlets, or upon any other account, till he had gotten into that latitude. In the prosecution of this great design, motives of interest were annexed to obligations of duty. By a new law, passed in 1776, supplying the deficiencies of the act of 1749, it was enabled, that if any ship belonging to any of his majesty's subjects, or to his majesty, shall find out, and fall through, any passage, by sea, between the Atlantic and Pacific oceans, in any direction, or parallel of the northern hemisphere, to the northward of the fifty-second degree of latitude, the owners of such ships, if belonging to any of his majesty's subjects, or the commander, officers, and seamen of such ship belonging to his majesty, shall receive, as a reward for such discovery, the sum of 20,000l. Two vessels were fixed upon by government for the intended service; the Resolution and the Discovery; the former commanded by captain Cook, and the latter by captain Clerke. To the Resolution was allotted the fame number of officers and men, which she had during her former voyage; and the only difference in the establishment of the Discovery from that of the Adventure, was that she had no marine officer on board. Both ships were equipped in the most complete manner, and furnished with such an establishment and apparatus, &c., as might most effectually conduct to the improvement of astronomy and navigation. As the ships were to touch at Otahete and the Society islands, it was determined to carry Omai back to his native country, who returned with deep impressions of gratitude and respect for the liberal treatment which he had received during his absence, and while he continued in England. Captain Cook sailed from the Nore to the Downs on the 25th of June, and on the 30th anchored in Plymouth Sound, where the Discovery was already arrived. On the 8th of July he received his instructions, with orders to proceed to the Cape of Good Hope. On the 12th he sailed off Plymouth Sound, and proceeding in his course, touched at Teneriffe; anchoring on the 18th of August in the road of Santa Cruz. Having procured the necessary articles of refreshment, he sailed from Teneriffe on the 4th; and on the 13th arrived before Port Praya in the island of St. Jago, and then, not finding the Discovery there, sailed out to the southward. On the 1th of September, our navigator crossed the equator in W. long. 27° 28'; and on the 8th, being near the eastern coast of Brazil, he took pains to settle its longitude, which he concluded to be 35° 56' or 36° W. On the 18th of October, the Resolution came to an anchor in Table bay, at the Cape of Good Hope. On the 10th of November captain Cook had the satisfaction of seeing the Discovery arrive in the bay. Besides the attention which our captain manifested to the rate of his ship, and the accommodation of his crew in the further prosecution of his voyage, scientific objects engaged his particular note. On the 30th of November he weighed from Table bay, and on the 3d of December got clear of the land. On the 11th land was seen, which was found, upon a nearer approach, to consist of two islands. That which lies most to the south, and is the largest, was estimated to be about 15 leagues in circuit; the northerly one was about nine leagues; and the two islands are about the distance of five leagues from each other. The largest lies in S. lat. 46° 53', and E. long. 37° 40'; and the smaller one in S. lat. 46° 4', and E. long. 38° 8'. They seemed to have a rocky and bold shore, and their surface is for the most part composed of barren mountains, the fum- mits and sides of which were covered with snow. These two islands, with four others, which lie from nine to twelve degrees of longitude more to the east, and nearly in the same latitude, had been discovered by captain Marion du Fresne, and Crozet, French navigators, in January 1774. As no names had been allotted to them in a chart of the Southern ocean, communicated by Crozet to captain Cook in 1773, our commander distinguished the two larger ones by calling them "Prince Edward's islands." To the other four he gave the name of "Marions" and "Crozets'" islands. Rounding southward of these islands, he shaped his course so as to get into the latitude of the land which had been discovered by M. de Kerguelen, a French navigator. On the 24th he observed land, which proved to be an island of considerable height, and about three leagues in circuit. He soon after discovered another island about the same size, and also a third, besides some smaller ones. Another island was seen in S. lat. 48° 29', E. long. 68° 40', which was a high round rock, and which was called "Ughie's Cap." This he perceived to be the same with Kerguelen's "isle of Ren- dows." As soon as the weather began to clear up, captain Cook decreed in for the land, called "Kerguelen's land." At length a good harbour was discovered, in which the ships anchored on Christmas day. Here the captain displayed the British flag, and named the place "Christmas Harbour." On the 29th he left this harbour, and ranged along the coast, in order to discover its position and extent. In pursuing his course he met with several promontories and bays, together with a few islands, of which he has discovered and named. Another harbour, which the ships anchored for one night, is situated in S. lat. 49° 3'; and E. long. 69° 37', and was called "Port Pellicier." On the 30th, when this harbour was discovered, he came to a point, which proved to be the very eastern extremity of Kerguelen's land. This point was called "Cape Digby," and is situated in S. lat. 49° 23', and E. long. 76° 34'. The result of captain Cook's examination of Kerguelen's land was, that it did not occupy an interval much exceeding 1° in degree. From this defective coast our captain took his departure on the 31st, intending to touch at New Zealand, but on the 3d of January 1777, the wind veered to the north, and on the 12th the northerly winds ended in a calm; the ship being then in S. lat. 48° 46', E. long. 110° 26'. On the 24th our voyagers discovered the coast of "Van Diemen's land," and on the 26th came to an anchor in "Adventure bay." While captain Cook was at this country, he neglected no inquiry which could promote the knowledge of navigation, and other branches of science. He settled the latitude and longitude of places, marked the variations of the compass, and recorded the nature of the tides. Adventure bay he found to be situated in S. lat. 43° 21' 26", and E. long. 147° 29'. On the 30th of January he sailed from this bay, and on the 12th of February came to his old station in Queen Charlotte's Sound, in New Zealand. Here he found that ten men, who had separated from captain Furneaux's crew in the former voyage, had been murdered by the natives, and that their flesh had been consumed as food. The fear of revenge rendered them very averse from approaching the English vessels. On the 27th captain Cook got clear of New Zealand; and having met with unfavourable winds, it was not till the 29th of March that he discovered land, which was found to be an inhabited island, called "Mangerei," in S. lat. 21° 57'. E. long. 201° 53'. Purifying his voyage, on the 30th he again found land, which was an island, called by the natives "Waterooi," in S. lat. 20° 1'. E. long. 201° 45'. The next place which he visited was a small island called "Wenuoo-oette," or "Otakootaia," in S. lat. 16° 15'. E. long. 201° 37'. On the 5th he directed his course to "Harvey's island," which, he
he had discovered in 1777; and which he now found to be well peopled. Having by various adverse circumstances been so much retarded in his progress, that nothing could be done this year in the high latitudes of the northern hemisphere, he determined to bear away for the Friendly islands, where he was sure of being abundantly provided. Accordingly he reached Palmerston island in his course, where he obtained some refreshment; and after leaving this island, he steered to the west, with a view of making the halt of his way to "Amanuoko." On the 28th of April, he touched at the island of "Komango," and on the 1st of May arrived at Amanuoko. The only interruption of the harmony that subsisted between our voyagers and the natives of this island arose from the spiteful disposition of many of them. In order to correct and counteract this propensity, captain Clerke invented a mode of treatment which produced some effect, the putting of the thieves into the hands of the barbar, who completely shaved their heads. They thus became objects of ridicule to their countrymen, and their rogueries were restrained. Captain Cook having exhausted Amanuoko of its articles of food, proposed, on the 11th, to proceed directly for "Tongataboo." But it was recommended to him to touch at another island, or rather a group of islands, called "Hapae," lying to the N.E., where he might be plentifully supplied with every refreshment in the casual manner. Hapae was therefore chosen for the next station, where our commander arrived on the 17th, and met with a most friendly reception. Here the captain took an opportunity of examining not only Hapae, but "Lefonga," and other neighbouring islands. On the 19th of June he arrived at "Tongataboo," where he was kindly received, but somewhat molested by the thievish propensity of the inhabitants. On the 19th he left Tongataboo, and two days after came to an anchor in the island of "Middleburg," or "Eoa," as it is called by the inhabitants. Captain Cook remained at the Friendly islands between two and three months; and his intercourse with the natives was little interrupted. This intercourse was productive of many advantages. See FRIENDLY ISLANDS.

On the 17th of July, captain Cook resumed his voyage; and on the 8th of August, an island was discovered, called by the natives "Tobousi," and situated in S. lat. 23° 35', E. long. 210° 37'. Pursuing his course he reached Otaheite on the 12th, and steered for Oteitepeha bay, designating to anchor there before he went down to Matavai. Omai's reception among his countrymen was not entirely of a flattering nature. Nothing that was peculiarly striking occurred at their first meeting; his interview with his father, however, was agreeable to the feelings of nature; and his aunt threw herself at his feet, and bedewed them with tears of joy. On the 24th, the captain resumed his old station in Matavai bay. On this visit he was fully satisfied that human sacrifices formed a part of the religious institutions of Otaheite; for he was witness to a solemnity of this kind, which he has particularly described with the jeal threats of indignation and abhorrence. Here the captain was cured of a rheumatic complaint, extending from the hip to the foot in an extraordinary manner. The mother of Oto, a chief of the island, his threeisters, and eight other women, undertook the cure. Being desired to lay himself down amongst them, as many as could get round him began to squeeze him with both hands, from head to foot, but more particularly to the part where the pain was lodged, till they made his bones crack, and his flesh became a perfect mummy. After undergoing this discipline about a quarter of an hour, he was glad to be released from his female friends. The operation, however, gave him immediate relief, so that he was encouraged to submit to another rubbing down before he went to bed; the consequence of which was, that he was tolerably easy the whole succeeding night. His female physicians repeated their prescription the next morning, and again in the evening; after which his pains were entirely removed, and the cure was perfected. This operation, which is called "Romor," is universally practised among these islanders: being sometimes performed by the men, but generally by the women. During this visit of our voyagers to Otaheite, such a cordial friendship and confidence subsisted between them and the natives, as never once to be interrupted by any untoward accident. From Otaheite our voyagers passed to the 30th to Emeco, where they anchored. The transactions on this island were, upon the whole, unpleasant. On the 11th of October, the ship left it, and next day arrived at Owharre harbour, on the west side of Huahine. Here they settled Omai to mutual satisfaction; having procured for him a portion of land and built a house, on the outskirt of which was this inscription:

GEORGIA TERRITOR. REV. 2 NOVEMBER, 1777.

NAVIT. [Resolution, first. Cook, Pr.]

After parting with Omai in an affecionate manner, and leaving him comfortably settled among several of his relatives, captain Cook arrived at Batolabola, the last of the Society islands, which he visited on the 8th of December. Upon the whole, it has been observed, that the future felicity of the inhabitants of Otaheite, and the Society islands, will not a little depend on occasional visits from Europe, for it would have been better for these poor people, as captain Cook says, never to have known our superiority in the accommodations and arts which render life comfortable, than, after once knowing it, to be again abandoned to their original incapacity of improvement. On the 8th of December our commander sailed from Batolabola, and in the night between the 22d and 23d, crossed the line in E. long. 203° 15', and on the 24th discovered land, which was called "Christmas island," the west side of it, on which was observed an eclipse of the sun, being in N. lat. 1° 59', E. long. 223° 30'. On the 2d of January 1778, the ships resumed their course towards the north, and in their progress discovered three islands. On the 22d they touched at one of these islands, called by the natives "Atori;" and where captain Cook found the horrid practice of eating human flesh, which the inhabitants denominated "favour eating." But it was ascertained that one of these islanders has been observed to suckle a child in vailits of land, he observed the first object of this abominable custom. "Near this was another island, called "Otehecow," where our commander anchored on the 29th. It is observed, that the islands in the Pacific ocean, which European voyagers have discovered, have generally been found to lie in groups, or clusters. This was the case with those that were now visited; and to which captain Cook gave the name of "Sandwich islands," which lies on the 2d of February, our navigators pursued their course to the northward; and on the 7th of March they discovered the coast of "New Albion," the ships being then in N. lat. 44° 33', E. long. 235° 20'. In ranging on the west side of America, captain Cook gave names to several capes and head lands, which appeared in light. At length, on the 29th he anchored in an inlet, where the country appeared full of mountains, with snow covering their summits, interspersed with valleys which produced high shrub trees, exhibiting a beautiful prospect, as of one vast forest. The ships were now in N. lat. 49° 29', E. long. 232° 29'. The inhabitants on the coast appeared to be disposed to maintain a friendly intercourse with ilrang.
and a trade immediately commenced, the articles of which were the skins of various animals, such as bears, wolves, foxes, deer, raccoons, pelicans, and martins; and, particularly, sea-otters. Garments made of these were also offered for sale; the most extraordinary articles, however, were human skulls, and hands not quite stripped of their flesh, some of which exhibited marks of having been upon the fire. In exchange the natives took knives, chisels, pieces of iron and tin, nails, looking-glasses, buttons, or any kind of metal. Although commerce was, in general, carried on with mutual honesty, some of these people were no less inclined to theft than the islanders in the Southern Ocean. Of all the uncivilized tribes, which our commander met with in his various navigations, he never found any who had such fixed notions of their right to the exclusive property of everything which their country produced, as the inhabitants of the Sound, where he was now stationed. With Captain Cook, very much to the honour of his character and of his country, it was a sacred rule never to take any part of the property of the people whom he visited, without an ample compensation. Whilst the ships were under repair for the prosecution of the expedition, our captain improved every opportunity that occurred for extending his knowledge of the manners and customs of the inhabitants, who, in general, treated him with great civility. The natives were much addicted to singing; and in some instances, the whole body joined, some in a flow, and others in a quicker time; accompanying their notes with the most regular motions of their hands, or with beating in concert with their paddles, on the sides of the canoes, to which were added other very expressive gestures. At the end of each long, they continued silent for a few moments, and then began again, sometimes pronouncing the word _Home!_ forcibly as a chorus. At our captain's first arrival in this inlet, he denominated it "King George's Sound," but he afterwards informed that the natives called it "Nootka." The entrance of the Sound is situated in the east corner of Hope bay, in N. lat. 45° 53'. E. long. 23° 12'. On the 26th the repairs of the ships being completed, every thing was ready for the captain's departure. In the prosecution of the voyage to the north, and back again to the Sandwich islands, the incidents that occurred were chiefly of a involuntary kind. The first place at which Captain Cook landed, after his departure from Nootka Sound, was an island which he called "Kaye's island," situated at its S.W. point in N. lat. 59° 49'. E. long. 21° 58'. To an inlet in which the ships anchored on the 12th, he gave the appellation of "Prince William's Sound." Some days after leaving this Sound, our navigators came to an inlet, which they hoped would be found to communicate with the sea to the north, or with Baffin's or Hudson's bay to the east; and therefore they determined particularly to examine it. In consequence of a complete investigation of this inlet, it was discovered to be a river, which was afterwards called "Cook's river." On the 6th of June they got clear of this river, and pursuing their voyage, they failed on the 15th, amid the group of islands, which had been called by Beering "Schumagin's islands." On the 21st, among some hills, on the main land, that towered above the clouds to a most amazing height, one was discovered to have a volcano, which continually threw up vast columns of smoke. It does not stand far from the coast, and is situated in N. lat. 53° 38', and long. 195° 45'. The mountain is of a completely conical figure, and the volcano is at its very summit. A canoe, from an island in the neighbourhood, approached the ship, and the fickle person on board bowed as he came near. From such tokens of politeness, our captain reasonably inferred, that the Ruffians must have some communication and traffic with these people. On the 27th our voyagers reached an island, known by the name of "Onalaska," the inhabitants of which behaved with a degree of politeness uncommon to savage tribes. The harbour of "Samgamoooda," on the north side of the island, in which captain Cook came to an anchor, is situated in N. lat. 55° 55'. E. long. 193° 50'. On the 28th July our voyagers left Onalaska, and on the 16th were within sight of a promontory, on which lieutenant Williamfon landed; but he found that the land, as far as his view extended, produces neither tree nor scrub, though the lower grounds were not delititious or grass; and of some other plants. To this promontory, in N. lat. 56° 42'. E. long. 197° 36', was given the name of "Cape Newham." When our navigators, on the 31st of August, had advanced to the latitude of 62° 34', they had the misfortune to lose Mr. Anderfon, the surgeon of the Resolution, who had been more than twelve months been lingering under a consumption. Mr. Anderfon, who was a person of a cultivated understanding and agreeable manners, to distinguifhed skill in his own profession, added a very considerabe knowledge in other branches of science. An island, discovered soon after his death, was honoured with the appellation of "Anderfon's island." On the 9th captain Cook anchored under a point of land, to which he gave the name of "Cape Prince of Wales," situated in N. lat. 67° 46'. E. long. 191° 45', and remarkable for being the most western extremity of America hitherto explored. "This extremity is distant from the eastern cape of Siberia only 13 leagues; and there our commander had the glory of ascertaining the vicinity of the two continents, which had only been conjectured from the reports of the neighbouring Asiatic inhabitants, and the imperfect observations of the Ruffian navigators. Resuming his course on the 10th, captain Cook anchored in a bay, the land of which was at first supposed to be a part of the island "Alaachka;" but from the figure of the coast, from the situation of the opposite shore of America, and from the longitude, the captain thought to be more probably the country of the "Tschufki," on the easterly extremity of Asia, which had been explored by Beering in 1728; and this was found to be the fact. From the bay of St. Lawrence, below the entrance of the Tschufki, our navigators steered, on the 11th, to the east, in order to get nearer to the coast of America. Afterwards, proceeding to the north, they reached, on the 17th, the latitude of 70° 31', in longitude 195° 41'. On this day a brightness was perceived in the northern horizon, resembling that which is reflected from ice, and which is commonly called the "bikin." In about an hour's time, the sight of a large field of ice removed all doubt in captain Cook's mind with respect to the cause of the brightness of the horizon. The ships were soon close to the edge of the ice, in lat. 70° 41', and unable to proceed any farther. On the 18th, in lat. 70° 44', the ice near them was as compact as a wall, and judged to be at least ten or twelve feet high. Farther to the north, it appeared much higher. A prodigious number of sea-horses lay upon the ice; and some of them were procured for food, in order to supply the want of fresh provisions. Our voyagers lived on the sea-horses as long as they lasted; and they were generally preferred to salt provisions. Captain Cook continued, until the 29th, to traverse the icy sea beyond Beering's strait, in various directions, and through numberless obstructions and difficulties. The seaon, indeed, was now so far advanced, that it would have been highly imprudent to have made any farther attempts, till the next summer, at finding a passage into the Atlantic. Our commander's attention was now directed to the discovery of a proper
proper place for obtaining a supply of wood and water; and to the manner in which he should spend the winter, with some improvements in geography and navigation, and so as to be in a condition to return to the north, for a farther search of a passage, in the ensuing spring. Before he proceeded to the south, he employed a considerate time in examining the sea and coasts in the vicinity of Bering's Strait, on the side both of Asia and America. In this examination, he ascertained the accuracy of Bering, so far as he went; demonstrated the errors with which Stutchin's map of the new northern Archipelago abounds; and made large additions to the geographical knowledge of this part of the world. "It reflects," as Mr. Cox justly observes, "the highest honour even on the British name, that our great navigator extended his discoveries much farther in one expedition, and at so great a distance from the point of his departure, than the Russians accomplished in a long series of years, and in parts belonging or contiguous to their own empire."

On the 2d of October, our voyagers came within fight of the island of Oonalashka, and anchored again in Samganodah harbour. Here, whilst the ships were repairing, the seamen collected berries, with which the island abounds; and, which, in conjunction with the spruce-beer, contributed efficiently to eradicate every fear of the scurvy that might exist in either of the vessels. They also procured an ample supply of fish. Captain Cook, on the 8th, received a very flimsy present, which was a rye-loaf, or rather a pie in the form of a loaf, for it included some salmon, highly flavoured with pepper. Captain Clerke received also the same kind of present. These presents, it was reasonably supposed, came, by the hands of an Oonalashkan, from some Russians in the neighbourhood. On the 10th corporal Ledlair of the marines returned from his researches with three Russian seamen, or furriers, who, with several others, refuted at "Engooehhar," where they had a dwelling-house, some store-houses, and a sloop of about 50 tons burthen. From these perfons captain Cook derived every possible degree of information. Afterwards, another Russian was introduced to our captain, whose name was Efrem Gregoroff Bin Inmyloff, and who was the principal person among his countrymen in this and the neighbouring islands. From him he obtained two charts, which he was permitted to copy. The first included the "Penfinskiia" sea; the coast of Tartary, down to the latitude of 41°; the Kuril islands; and the peninsula of Kamtchatka. The second chart, which was the most interfering, comprehended all the discoveries made by the Russians to the easterly of Kamtchatka, towards America; which, however, exclusively of the voyages of Bering and Tschernikoff, amounted to little or nothing. Indeed captain Cook was assured, that no Russians had even seen any part of the continent of America to the northward, except that which lies opposite to the country of the Tschinkits. On the 26th, all things being ready for captain Cook's departure, he put to sea, and failed for the Sandwich islands; it being his intention to spend a few months there, and then to direct his course to Kamtchatka, so as to endeavour to reach that country by the middle of May, in the ensuing summer. On the 26th of November, when the ships had proceeded southward to the latitude of 20° 5', land was discovered, which proved to be the island of "Moweck," one of the group of the Sandwich islands, with the inhabitants of which a friendly intercourse was maintained. Another island was discovered on the 30th, called by the natives "Owhyhee." Among the articles procured from the natives, was a quantity of sugar-cane, a strong decoction of which was found, upon trial, to be a very palatable beer; more especially when improved with a few hops. On the 16th of January 1779, canoes in great numbers came out from all parts of the island, so that the two ships were surrounded with no fewer than a thousand, crowded with people and laden with hogs, and other productions of the island. Some of them, however, manifested a thievish disposition, and captain Cook, in order to check it, ordered two or three muskets, and as many four pounders, to be fired over one of the canoes, which had carried away a rudder. Into a bay, affording good anchorage and fresh water, captain Cook resolved to take the ships in order to refit, and to obtain every refreshment which the place could afford. The bay in which the ships anchored on the 17th was called by the inhabitants "Karakaora." The vessels were soon surrounded with a multitude of canoes; and the whole shore of the bay was covered with spectators, whilst many hundreds were swimming round the ships like schools of fish. Our navigators were much impressed by the singularity of the scene; and few of them lamented their unsuccessful endeavours of getting homeward, the last summer, by a northern passage. "To this disappointment," says the captain, "we owed having it in our power to revive the Sandwich islands, and to enrich our voyage with a discovery, which, though the least, seemed, in many respects, to be the most important that had hitherto been made by Europeans, throughout the extent of the Pacific ocean." Such, also, is the concluding sentence of our illustrious commander's journal. Little did he then imagine, that a discovery which professed to annex no small honour to his name, and to be productive of very agreeable consequences, would be so fatal in the result. Little did he think, that the island of Owhyhee was destined to be the last scene of his exploits and the cause of his destruction.

The reception which the captain met with from the natives, on his proceeding to anchor in Karakaora bay, was in a very high degree encouraging. The natives expressed their joy by singing and shouting, and by exhibiting a variety of wild and extravagant gestures. During the long cruise of our navigators s the island of Owhynee, the inhabitants had conducted themselves in their dealings, almost universally, with fairness and honesty; but after the arrival of the ships in the bay, they altered their conduct. The immense crowds of islanders that encompassed the ships afforded frequent opportunities of pillaging without the risk of detection, and held out, especially as their number was much inferior to that of the English, the prospect of clear- ing with impunity. Another circumstance to which the alteration in the conduct of the natives may be ascribed, arose from the presence and encouragement of their chiefs, into whose possession the booty might be traced, and who were probably the inspirers of the depredations that were committed. Soon after the Revolution had gotten into her flotion, three chiefs, one of whom named Koah, who was a priest, and in his youth had been a distinguished warrior, visited the ship; and in the evening, Captain Cook, accompanied by Mr. Bayley and Mr. King, attended him on board. The captain was received with great civility and respect, on the part of the natives, approaching to adoration. The captain was particularly defiers of procuring from the island four salted hogs for sea-fare; and, with this view, of renewing former attempts in the operation for this purpose. The event answered his most sanguine expectations. On the 26th captain Cook had his first interview with Terrecchen, the king of the island; which was conducted with a variety of ceremonies, among which, the custom of exchanging names,
which among the islanders of the Pacific ocean is the strongest
pledge of friendship, was observed. The king, attended
by several chiefs, was conducted in a pinace on board
the Resolution; where they were received, apparently
much to their satisfaction, with peculiar attention and
respect. In the progress of the intercourse which was carried
on between our voyagers and the natives, the quiet and inof-
tensive behaviour of the latter took away every apprehen-
sion of danger and insured an unsuspicious confidence in
the English. A society of priests, in particular, displayed
a generosity and munificence, of which there are few exam-
pies; for they furnished a copious supply of hogs and ve-
tables to our navigators, without ever demanding, or
even suggesting, a return. Indeed, the conduct of the
warrior chiefs, or Earees, was always left satisfactory than
that of the priests. Although the kind and liberal beha-
vour of the natives continued without remission, Terreco-
booo, and his chiefs, began at length to be very inquisitive
about the time of the departure of the English; but this is
not surprizing, when we consider the enormous consumption
of hogs and vegetables, which had taken place during their
abode of 16 days in the bay. When the king was
informed that they were to leave the island in a day or
two, a proclamation was made through the island, requir-
ing the people to bring their hogs and vegetables, that
they might be presented by the king to the Orano, the ti-
tle of respect given to captain Cook, on his quitting the
country. Accordingly, on the 3d of February, being the
day preceding which was fixed for leaving the island,
Terreboobo invited captain Cook and Mr. King to attend
him to the place where Kaoo refided. On their arrival,
they found the adjoining ground covered with parcels of
cloth, and at a little distance an immense quantity of vege-
tables; and near them was a large herd of hogs. At the
close of the visit a great part of the cloth, and all the ve-
tables and hogs were given by Terreboobo to captain
Cook and Mr. King, who were astonished at the value of
the present. Such was the attachment of the inhabitants
of Owhyhee to Mr. King, that Terreboobo and Kaoo
waited upon captain Cook, whole for they supposed him to
be, to solicit his residence in their country. Early on
the 4th the ships sailed out of Karakakoa bay, being follow-
ed by a large number of canoes. It was the captain's de-
sign, before he visited the other islands to make a complete
survey of Owhyhee, in hopes of finding a better sheltered
bay than that which he had left; and upon failure of succ-
ses to take a view of the south-east part of Moorea, where,
as he was informed, he might find an excellent harbour.
After failing about the island of Owhyhee for several days, the
weather being stormy, and the foremast of the Resolution be-
ing damaged, our navigators returned on the 11th to Kar-
akakoa bay; but in coming to an anchor, they found their re-
ception to be very different from what it had been on their first
arrival. Their anxiety, however, was in some measure relieved,
by the return of a boat which had been sent on shore, and
which brought information, that Terreboobo was ab-
fent, and had left the bay under the Tako. The beha-
vour of the natives, however, appeared mysterious and ex-
cited fulpine; the interdict of intercourse, on pretence of
the king's absence, afforded reason for apprehending that
he only wished to gain time for consulting with his chiefs.
On the next morning Terreboobo arrived and immediately
visited captain Cook; this circumstance, and the return of
the natives to their usual friendly intercourse, were con-
dered as strong proofs, that they neither meant, nor appre-
hended, any change of conduct. Some other incidents
confirmed this opinion. Towards the evening of the 13th
information was received, that several chiefs assembled at
the well near the beach and drove away the natives who
had been hired to assist the sailors in rolling down the cars
of the ship. It was afterwards found, that the islanders
had armed themselves with stones and were very tumultu-
ous. Not to mention some instances of theft and subse-
cuent detections which occurred, one of a very serious and
unpleasant nature happened, which it may not be im-
proper to specify on account of the consequences that en-
folded. A canoe, belonging to Pareea, was seized; and he,
protesting his innocence with regard to the theft that had been committed, claimed his property. A feckle
took place between him and the English officer with some
of his companions, in which Pareea was knocked down by
a violent blow on the head, with an oar. The natives,
who had been peaceable spectators, immediately attacked
the English seamen with a shower of stones, which obliged
them precipitately to retreat and to swim off to a rock at
some distance from the shore. The pinace, which was
waiting for captain Cook's return, was immediately ran-
facked by the islanders; and if it had not been for the
reasonable interposition of Pareea, would have been entirely
demolished. Pareea interfered further in restoring the
pinace; and being assured that he would be kindly re-
ceived by the Orano, joined notes (according to their custom)
with the officers in token of friendship, and paddled over
to the village of Kowrowa. Captain Cook, on being informed
of this occurrence, expressed much uneasiness; "I am
afraid," says he, "that these people will oblige me to use
some violent measures; for," he added, "they must not be
left to imagine, that they have gained an advantage over us."
The confidence of our navigators in the natives gradually
abated; and they thought it necessary to be very much upon
their guard. At this time the cutter belonging to the Dis-
cover was stolen, and captain Cook made the necessary
preparations for the recovery of it. On occasions of a similar
kind, it had been his practice to get the king, or some of
the principal Earees, on board, and to detain them as hostages
till the article, that had been lost, was restored. This
method he meant now to pursue; and he also gave orders to
stop all the canoes that should attempt to leave the bay,
with an intention of seizing and destroying them, if by
peaceable means he could not recover the cutter. Captain
Cook and Mr. King, together with Mr. Philips, and nine
marines, left the ship; and when they landed, the captain
instructed Mr. King to quiet the minds of the natives, by
assuring them that they should not be hurt, to keep his people
together, and to be on his guard. Whilst Mr. King was
employed in executing his commission, captain Cook pro-
ceded to Kowrowa, where the king refided, and landed
with the lieutenant and nine marines. The people received
him with the usual tokens of respect; prostrating themselves
before him, and bringing their customary offerings of small
hogs. Having gained an interview with Terreboobo, he in-
vited him to return in the boat, and spend the day on board
the Resolution. To this proposal the old king assented, and
immediately accompanied him. One of the king's favourite
wives, however, befouathed him, with many tears and
remonstrances, not to go on board ; and two chiefs, who accom-
panied her, forced him to sit down. The natives, who were
collecting in great numbers on the shore, and who had been
alarmed by the hostileities that had previously occurred in
the bay, thronged round captain Cook and their king. The
lieutenant of marines, perceiving that they were much presed,
and thus rendered incapable of using their arms, if occasion
should require it, proposed to the captain to draw them up
along the rocks, close to the water's edge; and accordingly
they
they formed a line, at the distance of about 30 yards from the place where the king was sitting. The old king appeared to be much alarmed; and when captain King urged him to proceed, the chiefs interposed, and at first by prayers and entreaties, and afterwards by force and violence, insisted on his going where he was. The captain at length declined it, offering to Mr. Phillips, that it would be impossible to compel him to go on board, without the risk of killing a great number of the inhabitants. Captain Cook's offer had hitherto appeared to be in no danger; but a circumstance accidentally occurred, which gave a fatal turn to his situation. The boats, which had been flattened across the bay to prevent the escape of the canoes, fired at some of them that were endeavouring to go off, and unfortunately killed a chief of the first rank. The news of his death arrived at the village, where captain Cook was, just as he had left the king, and was walking slowly toward the shore. Upon this, the women and children were immediately sent off; and the men put on their war-mats, and armed themselves with spears and swords. One of the natives, having in his hands a stone, and a long iron spike (called a pahoua), advanced to the boats, flourishing his weapon in defiance, and threatening to throw the boats. The captain, after having ineffectually defied him to desist, fired a load of small shot, which, as the man had on his war-mat, served only to irritate and encourage the enraged people. Several stones were thrown at the marines; and one of the Erees attempted to stab Mr. Phillips with his pahoua, but failed in the attempt. Captain Cook now fired his second barrel, loaded with ball, and killed one of the foremost of the natives. A general attack on the boats immediately followed, which was returned by a discharge of musketry from the marines, and the people in the boats. The islanders, contrary to expectation, stood the fire with great firmness; and before the marines had time to reload, broke in upon them with dreadful shouts and yells. Four marines were cut off among the rocks, in their retreat; three more were dangerously wounded; and the lieutenant, who had received a stab between the shoulders with a pahoua, having fortunately recovered his fire, shot the man who had wounded him, just as he was going to repeat his blow. The unfortunate commander, the last time in which he was distinctly seen, was standing at the water's edge, and calling out to the boats to cease firing, and to pull in. If it be true, as some of those who were present imagined, that the marines and boatmen had fired without his orders, and that he was deluded in preventing any further bloodshed, it is not improbable that his humanity, on this occasion, proved fatal to him. For it was remarked, that whilst he faced the natives, none of them had offered him any violence; but that having turned about, to give his orders to the boats, he was stabbed in the back, and fell with his face into the water. On seeing him fall, the islanders set up a great shout, and his body was immediately dragged on shore, and surrounded by the enemy, who, snatching the dagger out of each other's hands, showed a savage eagerness to have a share in his destruction. "This fell," says captain King, "our great and excellent commander!" For other particulars, we refer to "Samwell's Narrative of the Death of Captain Cook." In consequence of the savage disposition of the natives, the whole remains of captain Cook could not be recovered. Although various means, soothing and menacing, were employed for this purpose, little more than the principal part of the bones could be procured. By the permission of the chiefs, our navigators were enabled to perform the last offices to their eminent and unfortunate commander. The bones, having been put into a coffin, and the service being read over them, were committed to the deep, on the 21st, with the usual military honours. What were the feelings of the companies of both the ships, on this occasion, the world must be left to conjecture; for those who were present, know, that it is not in the power of any pen to describe them.

Such was the high estimation in which the character and enterprises of captain Cook were held by neighbouring nations, that, when war was declared between France and England, a letter was issued, on the 15th of March, 1779, by M. Sartine, secretary of the marine department at Paris, and sent to all the commanders of the French ships, which, after doing honour to the importance and utility of his discoveries, ordered, that the ship of captain Cook should be treated with respect at sea. The adoption of this measure was suggested by M. Turgot, who also composed a memorial, in which he proved that honour, reason, and even interdict, dictated this act of respect for humanity; and it was in consequence of this memorial, as we learn from M. Condorcet (in his Life of M. Turgot), that an order was given not to treat as an enemy the common benefactor of every European nation.

The first thought of such a plan of conduct was very probably suggested by Dr. Benjamin Franklin, who, when he was ambassador at Paris from the United States of America, preceded the court of France in giving a similar requisition.

We shall close this article, as far as it respects the discoveries of captain Cook, with merely mentioning, that the Sandwich islands were further explored; that Kamtschatka was visited, and a friendly intercourse maintained with the Russian officers of that country; that our navigators experienced the most generous and hospitable treatment from major Behm, in particular, the commander of the garrison at Bolcharette; that they proceeded to the north, in pursuit of the grand object of the expedition; that, having pafted through Beering's Strait, and attained to somewhat more than 69° degrees of northern latitude, they found it absolutely impossible to penetrate through the ice, either on the side of America or on the side of Asia; that every hope being precluded of accomplishing, in this way, a passage into the Atlantic ocean, captain Clerke was obliged to come to the determination of falling back to the southward; that on the 22nd of April (1779) the captain died of a consumption (see his article); that captain Gore succeeded to the command of the Resolution, and lieutenant King to that of the Discovery; that a second visit was paid to Kamtschatka, which extended our acquaintance with that part of the world; that no small accession of information was acquired, with respect to geometrical science in general; that our voyagers pursued their course by the coasts of Japan and China; that they made some stay at Canton; that thence they proceeded to the Cape of Good Hope; that they came to an anchor at Stromness, on the 22nd of May, 1780; that both ships arrived at the Nore, on the 4th of October, after an absence of 4 years, 2 months, and 22 days; that, during the whole of the expedition, the Revolution lost only five men by sickness, three of whom were in a precarious state of health at their departure from England, while the Discovery did not lose a single man; and that the history of the voyage, from the time in which captain Cook's journal ends, was written with great ability by Mr. King. By the decease of captain King, who died at Nice in Italy, in 1784, this country suffered another loss of an able and scientific commander and navigator, who had left a memorial of his talents and services, which has honourably united his name with that of the immortal Cook.

In sketching the talents and character of captain Cook, strikingly illustrated in the actions and enterprises of his life, we
COOK.

we shall avail ourselves of the attention that is afforded us by his professed or incidental biographers. Captain Cook professed, in an eminent degree, an inventive mind, which, by its native vigour, suggested noble objects of pursuit, and the most effectual methods of prosecuting and attaining them. This faculty he exemplified in a great variety of critical and difficult situations. To this kind of eminence he added unwaried application. By his genius and unremitting affinuity he acquired an extensive acquaintance not only with navigation, but with many other sciences. He was so well informed with regard to different branches of the mathematics, and particularly in astronomy, that he was able to take the lead in various observations of an astronomical kind, in the course of his voyages. In general literature, and even the art of composition, he was so great a proficient, that he acquired reputation, not merely as the performer, but as the narrator, of his various interlacing enterprises. Perseverance and steadiness in the prosecution of the objects to which his life was devoted, were distinguishing features of his character; and such was the invincible fortitude of his spirit, that no difficulties or dangers intimidated him, or deterred him from accomplishing any purpose which he formed, or which the hazardous services assigned him required. His fortitude was of course accompanied with complete self-possession. This latter quality was eminently useful to him in many critical and trying circumstances. Accordingly it is observed, that the calmness and composure of his mind were such, that, after having given necessary directions, he could take his rest, and sleep during the hours which he allotted to himself with perfect freedom. To the great qualities professed by captain Cook, he added the most amiable and conciliatory virtues. His humanity is illustrated in the whole course of his conduct, during his succedaneous voyages; with regard to the inhabitants of the countries which he visited, and with respect to the accommodation, health, and comfort of his own crewmen. In the private relations of life, he maintained an excellent and exemplary character, as a husband and father, and as a sincere and steady friend; and his loquacity and virtue gave stability and security to every moral qualification. He was also distinguished by the simplicity of his manners. In conversation he was unaffected and unassuming; and yet, on necessary occasions, obliging and communicative. To this general account of his talents and virtues, we shall subjoin some delineations of his character by those who were in habits of intimate acquaintance with him, and who had an opportunity of marking his temper and conduct in the various trying circumstances that occurred in the course of his life. Captain King, the continuator of the journal of his last voyage, has given us the following sketch of his character: “The constitution of his body was robust, inured to labour, and capable of undergoing the severest hardships. His stomach bore, without difficulty, the coarset and most unpalatable food. Indeed temperance in him was scarcely a virtue; so great was the indolence with which he submitted to every kind of self-denial. The qualities of his mind were of the same hardy, vigorous kind with those of his body. His understanding was strong and peripatetic; his judgment, in whatever related to the services he was engaged in, quick and sure. His feelings were bold and manly; and both in the conception, and in the mode of execution, bore evident marks of a great original genius. His courage was cool and determined, and accompanied with an admirable presence of mind in the moment of danger. His manners were plain and unaffected. His temper might perhaps have been jutly blamed, as subject to haughtiness and passion, had not thee been disarmed by a disposition the most benevolent and hu-
frequently interposing, at the hazard of his life, to protect them from the sudden remembrance of his own injured people. The object of his last mission was to discover and ascertain the boundaries of Asia and America, and to penetrate into the northern ocean by the N. E. Cape of Asia.

Traveller! contemplate, admire, revere, and emulate this great master in his profession; whose skill and labours have enlarged natural philosophy; have extended national science; and have disclosed the long unfelt and admirable arrangement of the Almighty, in the formation of this globe; and, at the same time, the arrogance of mortals, in presuming to account, by their speculations, for the laws by which he was pleased to create it. It is now discovered, beyond all doubt, that the fame great being who created the universe by his fiat, by the same ordinance of earth to keep a just poise, without a corresponding southern continent—and it was so! "He stretches out the north over the empty place, and hangs the earth upon nothing." Job xxxvi. 7.

If the arduous but exact researches of this extraordinary man have not discovered a new world, they have discovered seas unannounced and unexplored before. They have made us acquainted with islands, people, and productions, of which we had no conception. And if he has not been so fortunate as Americus to give his name to a continent, his pretensions to such a distinction remain unviolated; and he will be revered, while there remains a page of his own model account of his voyage, and as long as mariners and geographers shall be instructed, by his new map of the southern hemisphere, to trace the various courses and discoveries he has made. If public services merit public acknowledgments; if the man who adorned and raised the fame of his country, is deserving of honour, then captain Cook deferves to have a monument raised to his memory, by a generous and grateful nation.

"Virtutis uberrimum alimentum est honos."

Val. Max. I. i. c. 6.

From the numerous poetical tributes, paid to the memory of captain Cook, by our elegant female writers, we must confine ourselves to a single extract from Miss Hannah More's poem on "Slavery."

"Had those adventurous spirits who explore Thro' ocean's trackless waftes, the far-fought shore, Whether of wealth infatiate, or of power, Conquerors who walk'd, or ruffians who devour! Had these poss'd O Cook! thy gentle mind, Thy love of arts, thy love of human-kind; Had these pur'd thy mild and liberal plan, Discoverers had not been a curse to man! Then, blest'd Philanthropy! thy social bands Had link'd disstress'd worlds in brother's bands; Careless, if colour, or if climate divide; Then lovd, and loving, man had liv'd, and died."

Miss Seward's admirable poem in celebration of captain Cook's memory would have furnished many pleasing extracts, if our limits allowed our farther enlarging on this interesting article; but we must refer the reader to this lady's elegy on the occasion.

The Royal Society justified their respect for the memory of their illustrious members by medals, struck on this occasion, some of gold, others of silver, and others of bronze; the expense of which was defrayed by subscription. On one side is the head of captain Cook in profile, and round it, *JAC. COOK OCEANI INVESTIGATOR ACERERUS*; and on the exergue, *REG. SOC. LOND. SOCIO SUO*. On the reverse is a representation of Britannia, holding a globe; round her is inscribed, *NUL INTENTIUM, SOUTER LIQUERUS*; and on the exergue, *AUSPICIAE GEORGINH HII.*

Among the numerous testimonies of regard that have been rendered to the merits and memory of captain Cook, the important object of providing for his family hath not been forgotten. Soon after his death was known, the lords of the admiralty presented a memorial to his majesty; and he was pleased, by the advice of his privy council, to order a pension of 200l. a year to be settled on the widow, and 25l. a year to each of the three sons of the captain.

A considerable benefit also redounded to his family from the fate of the charts and plans, belonging to the voyage to the Pacific ocean, which were provided at the expense of government. On September the 3d, 1785, a coat of arms was granted to the family, with an appropriate device. Our navigator had six children. On the subject of this article fee the fift, second, and third voyages of Cook; the fift included in Hawksworth's Voyages, published in 3 vols. 1773. The second, written by captain Cook himself, and published in 2 vols. 1777, and the third published in 3 vols. 1784; the fift and second being written by captain Cook, and the third by captain King.

To the fift of these volumes is prefixed an introduction by Dr. Douglas, the late bishop of Salisbury, containing a brief historical account of voyages that had been previously performed with a view to the objects comprehended by those of captain Cook, a concise statement of his discoveries, and a detail of the advantages resulting from them. See also Kippis's Life of Captain Cook, and Biog. Brit. vol. iv.

**Cook, Captain Henry**, a choir-man, brought up in the chapel-royal during the reign of Charles I., which he quitted at the commencement of the grand rebellion, and went into the king's army, where he considerably distinguished himself; and in 1645, obtained a captain's commission. At the restoration, he was appointed master of the children of the chapel-royal. He composed the coronation anthem, according to Ant. Wood, for Charles II., and a hymn in four parts, composed by him, is likewise laid to have been performed instead of the litany, in the chapel of St. George at Windsor, by order of the sovereign, and knights of the garter, on the 15th of April 1661. None of his pieces, music, however, was printed, nor has Dr. Tudway inserted any of his compositions in the voluminous MS. Harleian collection of English sermons and anthems. And, indeed, if we may judge of them by the few secular compositions which appear in the collections of the times, he was little fitted for the high office to which he was appointed at the restoration. In the second part of Playford's "Musical Companion," 1667, there are two or three of his songs which are dry, ill accented, and equally defective of melody and masterly harmony. However, he had the merit, or at least the good fortune, to be the master of three boys among the children of the chapel, who gave very early testimony of their genius and progress in composition. Those were Pelham Humphrey, John Blow, and Michael Wise, who, even while they were choristers in the chapel, produced veris anthems, far superior in melody and design to any that our church could boast, anterior to Purcell. Cook died in 1672, according to Ant. Wood, of grief, at being so far surpassed in composition by his young pupil, Pelham Humphrey.

**Cook, Dr. Benjamin**, an eminent organist and contrapuntist, in the style of our best ecclesiastical composers, whom he had studied from Tallis, to Crofts, Weldon, and Green: a very correct harmonist and good organ player, but with
limited powers of invention. He was organist of Welb- 
mutter Abbey, and on the death of Kelway elected or-
ganist of St Martin's in the Fields. He long prede- 
ceded the Crown and Anchor concert, which was originally esta-
blished for the preservation of the best works of the most 
eminent masters of old times. It is a curious circumstance, 
that at this concert of ancient music, Handel was regarded 
as an innovator, and Geminius thought it an honour to 
be allowed to dedicate his last concertos to this society. Dr. 
Peuplish, who established and directed this concert, to 
the time of his death, never allowed Handel another merit 
than that of a good practical musician. The irreconcilable 
enemy between the lovers of old and new music, became 
from the time of this institution, as violent as the rage be-
tween the champions of ancient and modern learning. Dr. 
Cook, a steady votary of the old masters, died September 
1757. He was the son of Benjamin Cook, who kept a 
music shop in New-street, Covent Garden, and who pub-
lished by patent, among other things, six concertos for 
vioins, tenor and bays, by Alexander Scarlatti; the chamber 
lymphs of Porpora, for three instruments; and the two 
books of litanions by Domenico Scarlatti, in long 4to., of 
which Redgrave was the editor. After the decease of 
Cook, Johnson reprinted Scarlatti's litanions, with the same 
title page, and the same errors, as had escaped correction 
in the former edition.

Cook, Henry, a native of this country, born in 1642. 
Having a taste for historical painting, he travelled to Italy, 
for the purpose of improving himself in this branch of the 
art, and fluced under Salvator Rafa; but, on his return 
from England, met with so little encouragement, that for 
many years he remained in want and obscurity. At length, 
however, his talents gained him notice, and he was employ- 
ed by king William to repair his cartoons; he likewise 
feigned the equestrian portrait of Charles II. at Chelsea-
college, painted the choir of New-college chapel Oxford, 
and the haircase at Ranelagh house, besides many other works 
mentioned by Mr. Walpole. He is also said to have tried 
portrait painting, but to have given it up, disquieted with 
the caprices of those who fat to him. He died 18th Nov. 
1700. Walpole's Anecdoles.

Cook, in Ichthyology, a species of fish, which is some-
times taken in great plenty on the coast of Cornwall. It 
is a feyly fish, and does not grow to any great size: 
the back is purple, the belly yellow, and the tail rounded.

Cook's River, in Geography, a river of North America, 
which runs into the northern Pacific ocean, between Cape 
Elizabeth and Point Banks, i.e. between E. long. 207° 
3', and 207° 45'; N. lat. 52° 42', and 52° 12'; and which, 
by its various branches, opens a very considerable inland 
navigation. This name was given to the river by lord Sand-
wich, in honour of captain Cook, who, in the year 1779, 
traced it as high as the latitude of 64° 30', and the longi-
tude of 240°, or about 70 leagues from its entrance, with- 
out perceiving the least appearance of its source. "It was a 
factsation to me," says this perceiving navigator, (Third 
Voyage, vol. ii. p. 397.) "to reflect, that, if I had not ex- 
named this very considerable inlet, it would have been 
ruined, by speculative fabricators of geography, as a fact, 
that it communicated with the sea to the north, or 
with Baffin's or Hudson's bay to the east; and been mark- 
ed; perhaps, on future maps of the world, with greater 
precision, and more certain signs of reality than the invisible, 
becase imaginary, traits of de Fuca, and de Fonte." Mr. 
King was ordered to land on the northern point of the low 
land, on the S.E. side of the river, there to display the 
flag, to take possession of the country and river in the name 
of his British majesty, and to bury in the ground a bottle, 
containing some pieces of English coin, of the year 1772, 
and a paper, on which were inscribed the names of the ships 
and the date of the discovery. Near the shore Mr. King 
observed about twenty of these natives, who, appearing 
with their arms extended, probably to express their peaceable 
disposition, and to shew that they were without weapons. 
When their alarm, occasioned by the sight of musquins, 
had subsided, they allowed their new visitants to approach 
them, and appeared to be cheerful and sociable. Their 
feers and their other battle weapons, as it was afterwards 
discovered, were hid in the bushes close behind them. The 
ground was swamy, and the soil poor, light, and black. It produced a few trees and shrubs, such as pines, 
alder, birch, and willows; rofe and current bushes, and a 
little grafs, but not so much as a single plant or flower was 
discovered. On a future day, several large and some small 
canoes, with natives, came off to the British ships, and 
betook their waif; after which, they told their garments, 
till many of them were quite naked. Among others, they 
brought a number of white hare or rabbit skins, and very 
beautiful reddih one's of foxes; but there were only two or 
three skins of otters. They also fold pieces of salmon and 
fishets. They preferred iron to evry thing else offered to 
them in exchange. The lip-ornaments did not seem fo fre-
quent among them as at Prince William's Sound; but they 
had more of those which pass through the nose, and, in ge-
neral, they were also much larger. They had, however, 
a greater quantity of a kind of white and red embo-
dowed work on some parts of their garments, and on 
other things, such as their quivers and knife-cases. On the 
west side, a volcano was discovered, in lat 66° 2'; and this 
is the first high mountain N. of mount St. Augustine. 
The volcano is on that side of it next the river, and not far 
from the furamitt. It only emitted a white smoke without fire. 
Captain Cook observes, that all the people met with near 
this river, seemed, by every striking token of resemb lance, 
to be of the fame nation with those who inhabit Prince Wil-
jiam's Sound, but essencefully differing from those of Neopta, 
or King George's Sound, both in their persons and la-
nguage. The language of this is rather more guttural; 
but, like the others, they speak strongly and distinctly 
in words which seem to be sentences. These people are in 
possession of iron; that is, the points of their spears and 
their knives are of this metal, and some of the former are also 
made of copper. Their spears are like our spookons; and 
their knives, which they keep in sheaths, are of a considerable 
length. These, with a few glafs beads, were the only things 
seen among them that were not of their own manufacture. 
Their beads and iron they must have received from some 
civilized nation; and it seems most probable, that they 
procured them through the intervention of the more inland 
tribes from Hudfon's Bay, or the settlements on the Cana-
dian lakes; unless it can be supposed (which, however, 
is less likel) that the Russifn traders from Kamtchatka, have 
already extended their traffic so far; or at least that the na-
tives of their molt easterly Fox islands, communicate along 
the coaft, with those of Prince William's Sound; which see. 
The Russiffns themselves, says captain Cook, have never 
been among them; for if that had been the case, we should 
hardly have found them clothed in such valuable skins as 
those of the sea-otter. There is not the least doubt, con-
tinues captain Cook, that a very beneficial far trade might 
be carried on with the inhabitants of this vat coaft. But 
unless a northern paffage should be found practicable, it 
seems rather too remote for Great Britain to receive any 
emolument from it. It must, however, be observed, that 
the
the most valuable, or the only valuable, flns which Cook saw on the west side of America, were those of the sea-otter. All their other skins seemed to be of an inferior quality, particularly those of their foxes and martins. M of the skins that are fitted for sale, are those which are made up for outer garments, and this is the chief use for which they kill the animals. By increasing intercourse with purchasers, they would be more affiduous in procuring skins, and thus a plentiful supply might be obtained in this country.

In Cook's river, the tide is very considerable, and much contributes to facilitate the navigation of it. It is high water in the stream on the days of the new and full moon, between two and three hours; the tide rises perpendicularly, between three and four fathoms. The reason of the tides being greater here than at other parts of this coast, is, that, the mouth of the river being situated in a corner of the coast, the flood from the ocean is forced into it by both shores, and thus swells the tide to a great height. The variation of the compass was 25° 45' E.

Cook-room, in a Ship, is where the cook and his mate drefs and deliver out the meat, &c.

Cook's Strait, in Geography, so called from its discoverer captain Cook, a strait which separates the two islands that form New Zealand. This strait is about four or five leagues broad; and the islands, thus divided, are situated at the latitudes of 34° and 45° S; and between the longitudes of 178° and 190° W. See New Zealand.

COOKE, Sir Anthony, in Biography, governor, preceptor, or schoolmaster, to king Edward VI., and great grand-son to sir Thomas Cook; lord-mayor of London in 1562, was born at Giddy-hall in Essex about the year 1506, and educated, probably, at Cambridge. He became eminent in literature and the arts, being a thorough master of the Latin and Greek languages, an excellent critic and philologist; and equally skilled in poetry, history, and the mathematics. He was no less distinguished for his piety and good-ness. These qualities recommended him to the office of in-structor to king Edward VI., and the royal pupil is well known to have done honour to the talents and character of his preceptor. During queen Mary's reign he was an exile for religion; but upon the accession of queen Elizabeth he returned to his native country, fixing his residence at Giddy-hall, the building of which he completed. He died June 31, 1576, having attained the age of 70 years, and was buried in the chapel of Runford in Essex, where a monument was erected to his memory. He left four daughters, eminently learned in the Greek and Latin languages; viz. Mildred, married to sir William Cecil, baron Burleigh; lord-treasurer of England; Anne, wife of sir Nicholas Bacon, lord keeper of the great seal; Elizabeth, married to John, lord Ruffell, son and heir of Francis earl of Bedford; and Catherine, wife of Henry Killigrew, esq. He also had two sons.

COOKERY of Meats, in Domestic Economy, denotes the application of heat to the several animals taken both from vegetables and animals. The advantages attending the application of heat to vegetable substances are thus rendered more soluble in the human stomach. The only doubt, says Dr. Cullen, that can arise with regard to this, respects vegetables to which in their crude state a boiling heat is immediately applied, so that in many of them a coagulation is produced; in consequence of which they seem to be rendered less soluble in water than they were before—but this, he says, does not seem to have any effect on their solution in the stomach. Whether the difficult solution be observed by some degree of fermentation that necessarily takes place in the stomach, or by the powers of the gastric fluid, it is not necessary to determine, as it is certain that the action of heat separates in some measure the small particles of bodies, and thereby renders them more readily separable by the solvent powers of the stomach. 2. The application of heat separates and dilutes the volatile parts of vegetable substances, which are seldom of a nutritious nature, and, in many cases, have a tendency to prove noxious. 3. The application of heat to a certain degree extricates and dilutes a considerable quantity of air, which, in the natural state of vegetables, is always fixed in their substance; and it is probable, in this way especially, that heat will contribute to the dividing and loosening of the cohesion of the final parts of vegetable substances. It is certainly in this way, by diluting a large portion of their air, that vegetables are rendered less liable to fermentation, and less liable to produce that flatulence, which is occasionally so troublesome in the stomach and intestines. Dr. Cullen observes further, that, as the heat may be employed in two ways, either in a humid or a dry form; the former is always better suited than the latter to all the purposes above-mentioned. The cookery of animal substances also confinis chiefly in the application of heat. Other practices, however, previous to cookery, may be considered as parts of it; particularly salting, drying, and pickling. These practices, however, are merely useful for the purposes of domestic economy, as preserving meat from putrefaction, before it is subjected to heat, for a longer time than it could be preserved without such means. These practices, Dr. Cullen thinks, can never increase the nutritious quality of meat, or render it even of more easy digestion. Drying certainly brings the solid parts of meat more closely together, which must render it of more difficult solution. The addition of salt, which stimulates the stomach, may seem in some cases to promote digestion; but this must be when the salt is added in small quantity, and when the meats preferred by it are taken in moderate quantity only. For when meats have been long salted they are hardened, and rendered in proportion less soluble in the stomach: and a large quantity of salt accompanying them is certainly hurtful to the sytem. There is one part of animal food, which is made without any addition; and that is by its being kept for some time before it is subject to cookery, for a longer or shorter interval, according to the feasons, and the nature of the meat; but always till it has made some advance towards putrefaction. The tendency to this seems to take place from the moment that life is ex-tinguished in the animal; and the allowing of it to take place to a certain degree renders the meat more easily soluble in the stomach: and if the putrefaction be only in a moderate degree, it does not seem to injure the nutritious quality of the meat. The proper degree of putrefaction is not easily ascertained; and it is certainly different according to the constitution of the person. Some can use meats tainted in a considerable degree without inconvenience; whilst the digestion of others is much disturbed by the smallest quantity of putrid meat. Every advance in this towards putrefaction renders them, as Dr. Cullen says, more ready to increase the tendency of the animal fluids to that state which we take to be always hurtful to the human constitution, as it both favours the access of diseases, and aggra-vates their symptoms and danger when they occur.

The cookery of animal substances by the application of heat is of two kinds, as it is applied in a humid form by
boiling and stewing, or in a dry form, by roasting, broiling, and baking. For the processes and effects of boiling and stewing, see Boiling. The application of heat in a dry form is of two kinds, as it is in clove vessels, or as it is exposed to the free air. The skirt is baking, and though commonly in this practice the cover of the meat is merely pledge, any considerable exhalation is prevented, and the retention of the juices under the application of heat renders the meat more tender; and in all cases when the heat applied looses, and, in some measure, extractes the air, without exciting it, the substance is rendered more tender than when with any other application an exhalation is allowed. In broiling an exhalation takes place; but as the heat of a naked fire is more nearly applied, the outer surface is in a degree hardened before the heat penetrates the whole, and thus a great exhalation is prevented, while the whole is rendered sufficiently tender; but this kind of cookery is especially suited to meats that are chosen to be eaten lolling and any other exhalation of sufficient depth of is tufficiently tender. Cullen’s Mat. Med. vol. i. pt. i. c. 2.

COOK-HOUSE, in Geography, a town of America, situated on the Coquago branch of Delaware river, in the township of Colchester, New-York, 18 miles S. of the mouth of Unadilla river.


Gen. Ch. Cal. very small, five-cleft. Cor. Petals five, spreading. Stam. Filaments ten, distinct; anthers roundish. Fig. Germ somewhat pedicelled, bifurc; style one; stigma capitulate. Peric. Berry; Jutf. (Pom. Willd.) five-cleft; three frequently abortive. Seeds one in each cell.


COOLER, among Browsers, Diffusers, &c. a large vessel, usually of small depth and large surface, in which liquors are cooled, after having been boiled.

COOLIES, in the East Indies, are those natives who are employed in carrying of burdens, digging of trenches, and such laborious occupations; and, supplying the place of pioneers, cannot be dispensed with in the operations of military tactics in Hindoostan.

COOLING is the progressive decrease of temperature from a higher to a lower degree. From the highest degree of heat, which human industry has been able to obtain by means of combustion, or by concentrating the solar rays, to the lowest degree of it, which both natural and artificial methods have produced, the space is very considerable; and different parts of it have obtained diverse denominations, which are derived from the most striking phenomena that take place at particular points of the scale; thus we hear of porcelain heat, white heat, red heat, boiling heat, temperate, freezing, &c. and all these transitions from the first to the last, fall under the denomination of cooling; whereas the contrary transition from the lowest to the highest, is called heating. In order to preserve particularity, and to allude to each of the received denominations, the particulars which belong more immediately to it, we have divided the subject into three articles, under the words congealation, cooling, and freezing.

Under the first we have flated the phenomena of natural congelation; the last contains whatever relates to artificial freezing, viz. to the production of cold below 32° of Fahrenheit’s scale; and under the present, we shall principally state all the methods and the effects of cooling from the actual temperature of the atmosphere to a lower degree; but not below that of melting ice, viz. 32°, which is commonly called the freezing point.

The temperature of the atmosphere in the hottest climates, has hardly ever been known to exceed 15°, and it is but seldom that it reaches that most oppressive degree of heat. In the human species, nature has made ample provision, and has furnished them with industry sufficient for counteracting the effects of a very high or a very low temperature; but without any artificial assistance, few are the degrees of heat in which human beings can live with perfect comfort. Making some allowance for the natives of different climates, the whole range of temperature may be said to reach from the 60th to the 70th degree of Fahrenheit’s scale. Below 60° most persons have no objection to a gentle fire in their apartments; and above 70° they generally complain of heat. Yet when the natural temperature of the atmosphere is above 50°, cooled liquors are generally preferred for drink; but when the temperature is above 70°; then not only cooled liquors, but cool apartments also, are articles of great luxury; and it may in great measure be said of necessity. The languor which is commonly induced by heat, is in great measure relieved by artificial cooling. Patients affected with fevers of the intermittent and putrid kinds, which are so very common and destructive in hot climates, receive great benefit from the use of cooled liquors, and such are plentifully administered to them, whenever they can be obtained. The preservation likewise, of meats, fruit, butter, &c. in warm climates, or in the hot season, is considerably assisted by cooling; and it may be extended to a very remarkable long period by actual freezing.

In order to answer all these purposes, mankind has, from time immemorial, endeavored to discover and to apply methods
COOLING.

Methods of cooling, or of refrigeration. These methods, as far as they are at present known, may be comprised under the following heads: viz. 1st, the application of something naturally colder than the actual temperature of the atmosphere; 2dly, ventilation; 3dly, evaporation; and 4thly, the solution of certain saline substances. Sometimes two or three of these means are applied at the same time, to the article which is required to be cooled. In every country of Europe, and especially in the southern part of it, ice is collected during the winter, in proper places, and is used for cooling liquors, &c. in the summer season, or throughout the whole year. And this undoubtedly is the most easy, the most extensive, and the most effectual method of cooling. A little ice taken out of the ice-boule, and placed round a bottle of water or wine, in any convenient vessel, soon cools it to the desired degree; and if the effect is to be increased, fo as to freeze creams, fruit, &c. by breaking the ice into small pieces, and mixing common salt with it, the desired end will be obtained. The ice-boule itself is of very effectual use for preserving meat, fish, butter, fruit, &c. which things need only be laid in it, until they are wanted.

When ice cannot be easily procured, well water forms a useful substitute to a certain degree. When the depth of the well is 40 or 50 feet, or upwards, the constant temperature of its water is very nearly equal to the mean temperature of the country, which, of course, is lower than the usual temperature of the summer season in that country; hence, if a pail of water be drawn, and a bottle of wine, or other liquor, be immediately placed in it; a considerable refrigeration may be obtained, and it may be maintained by drawing fresh water at intervals from the well, &c. Thus in London the mean temperature is about 50°, and fo is the temperature of pretty deep wells throughout the year. Now in the summer season, the temperature frequently rises above 60°, or 70°; therefore, at those times, by applying fresh drawn well-water, the liquors we drink may be cooled about 15 or 20 degrees, which will render them incomparably more pleasant. When articles of food are required to be kept some time longer than the heat of the weather would allow, they may be placed in a basket at the end of a rope, and may be let down into the well, until they come within a foot or two of the water. For the higher pits, deep pits, caves, or grottos may be used; since their temperature is nearly equal to the mean temperature of the country, and suffers little or no variation between winter and summer.

Ventilation is nothing more than a constant change of air; but if the air which has just passed by a body, and that which succeeds it are all of the same temperature, no cooling will be produced by the ventilation; but the refrigeration will take place, when the body is hotter than the air which passes by it, or when an increase of evaporation ensues. Expose a thermometer to the open air, but shelter it from the wind, and when the thermometer is become stationary, let the wind fall upon it; and it will be found that the quicksilver is not lowered in it. But when a human being, or other animal is exposed to ventilation, the quick transition of air cools; first, because it continually removes the air which has been heated by the contact of the animal body, the breath, &c.; and secondly, because the evaporation from the body is increased by the ventilation. So that, upon the whole, the use of ventilation, such as is effected by means of fans, whistles, a particular disposition of apartment, and other machines, is to remove heated or vitiated air from the vicinity of human beings, from close habitations, prisons, slips, &c.

The ingenious Dr. Hales fixed a machine of this fort in the old Newgate prison, which, being put in action by means of
COOLING.

thermometer, at the same time that the evaporation from the cotton tends to lower it. And according as the one or the other of these opposite effects predominates, so the cooling effect is more or less conspicuous. From these observations it naturally follows, that the cooling, occasioned by evaporation, is greater when the evaporation is quicker, and contrarywise; also, that when different fluids are used for the evaporation, in similar circumstances, that fluid which evaporates quickest, produces the greatest refrigeration.

Mr. Cavallo says, "in order to try the degree of refrigeration produced by the evaporation of different fluids, I held up a naked thermometer, (viz. a thermometer, the bulb of which was not in contact with the metal of the scale) and poured upon its bulb a stream of some particular fluid, which spurted out of the capillary aperture of a tube; taking care to throw fluid enough to supply the walls by evaporation. By this means, when the temperature of the air was 64°, I found that the evaporation of water cooled the thermometer 8°; viz. brought it down to 56°; the evaporation of spirit of wine cooled it 16°; viz. brought it down to 48°; and the evaporation of ether cooled it 54°; viz. brought it down to 10°. But, by the use of the bulb pulvined sulphuric ether, when the temperature of the air was about 50°, I brought the thermometer down to 3°.

The cooling produced by the evaporation of other fluids needs not be mentioned; their effect being generally intermediate between the effect of water, and that of spirit of wine." (Phil. Trans. vol. lxxi.) Whatever promotes the evaporation, such as a dry air, and especially a dry wind, tends to increase the refrigeration; and when all the favourable circumstances concur, the effect is prodigious; so that in a dry, warm, and brisk wind, by means of the evaporation of the bulb pulvined ether, the temperature of any kind of bodies may be lowered many degrees below the freezing point; and animals might be easily frozen to death.

Though several of the above-mentioned particulars, and especially the cauls upon which they depend, have been but lately investigated and ascertained; yet the cooling effect of evaporation has been known and used by mankind from time immemorial. Athenaeus says, as being related by Protagoras of Cyzicum, that in the time of King Antichus, it was usual to cool water by evaporation, and to drink it as a luxury. A very easy and familiar experiment to show the effect of evaporation, may be performed in the following manner. Moisten a small space on the upper part of each hand; cover one of those places with an inverted wine-glass, and let a person blow with a pair of bellows upon the other hand. The latter will be fentily cooled, but not the former. Change the glafs and the blowing, from one hand to the other, and the effects will be reversed. Scamen, especially in the night time, frequently employ this natural effect for discovering which way the wind blows. They moisten a finger of their hand by putting it in their mouth; then expose it to the ambient air by elevating it above their head; and thus conclude that the wind blows from that quarter which is opposed to the most cooled side of the finger.

In warm climates, where the dryness of the air generally is very great, the refrigeration arising from evaporation is very considerable, and is of course frequently employed for counteracting the natural heat. The caravans which traverse the parched deserts of Arabia, are obliged to carry their supply of water in earthen jars upon camels; but in order to keep it pleasantly cool, the jars are involved in cloths, which they take care to keep continually moistened with water. It is a pretty common practice in the southern parts of Europe, as well as in the East and West Indies, in America, &c. to wrap up a bottle of wine, or water, or other liquor, in a wet cloth, and thus to suspend it in a shady place, either under a tree or in a passage, so as to expel to the briskest current of air that can be obtained; for by this means the liquor will be cooled several degrees; care, however, must be had to sprinkle more water upon the cloth, which surrounds the bottle, in proportion as the former evaporates. Mr. Walker, of Oxford, describes a peculiar method of producing a very considerable degree of cold by means of evaporation. "Having," he says, "in the course of the preceding winter, frequently succeeded in producing ice, by the cold produced from evaporation with water, when the temperature of the air was 38°; it occurred to me, that it might be possible to freeze water in the middle of summer, by a process which depended on this principle, by the use of water only. Accordingly, I procured a tall cylindrical vessel, holding about two gallons, in which I fixed a small spiral tube, as in the worm-tub of a common well; the lower end of this tube comes out through the vessel near the bottom, sufficient to connect the nozzle of a pair of bellows to it, by the intervention of a bladder, secured air-tight; this spiral tube ends at the top of the cylindrical vessel, where it is somewhat enlarged, like the mouth of a funnel. This vessel, being covered with flannel, was filled with water and hung out in a brisk dry wind, the temperature of the air being 50°; after some time, by repeatedly wetting the flannel on the outside of the vessel, I found the water within was cooled to 40°; air being then forced through the tube (by means of the bellows), surrounded by the cooled water, came out at the upper extremity of the tube at nearly the same temperature.

"A thermometer having its bulb covered with lint, and wetted repeatedly with the cold water in the vessel, placed so as to receive the draught of cold air from the tube, soon fell to 34°; hence by a series of two or three of these vessels, water might, upon this principle, be frozen at midsummer, recollecting that this experiment may always commence at 50°, the usual temperature of springs; and hence it might be possible upon the same principle, to caufe nature upon a small scale, even without the immediate interposition of art, to depart from her usual course, and to allude the hoary garray of winter to midsummer.

"For this purpose a current from the external air might be admitted into the tube, by means of a funnel, communicating with, and receiving, a conlant draught of air.

"In an attempt of this kind, it would be necessary (besides some other variation in the vessels, which circumstances might point out,) that the cylindrical vessels be porous, or pierced with small holes; so that the water may be con-stantly and gently oozing out.

In Spain, in Italy, in Egypt, and probably in other places, certain vessels are made of a porous earthen, which, when full of water, will just permit some of that fluid to ooze out of their external surface, whence it evaporates, and thus cools the remainder of the liquor within the vessel. The Spanish vessels for this purpose consist of a reddish brown earth. They are pretty broad, but not very capacious. In Italy they have been made of a pale yellowish material, but much larger. In Egypt they are made somewhat in the shape of a Florence flask, and not much bigger; but their aperture spreads out in the form of a cone, or rather of an ale glass, which is done for the convenience of drinking out of it. Their beauty is of the colour of ashes, and it is said to be found left on the banks of rivers. But vessels of any degree of porosity may be made by mixing sand and clay in various proportions.
C O O L I N G.

The utility of these vessels in Spain, in Italy, and especially in Egypt, is attended with a notable degree of refrigeration, on account of the great dryness of the air in those climates, which enables it to absorb a great deal of moisture in a short time; but the same vessels having been brought over, and having been tried, in this country, have been found to cool the contained liquor in a very trifling degree; evidently owing to the latitude of the air in this country, which is much less hot, and much less dry than in the above-mentioned places; therefore much less apt to promote evaporation.

One of the Egyptian vessels was tried in London at a time when the temperature of the atmosphere was at a mean, and after about half an hour, when almost three quarters of the water had passed through it, and had dropped down, the remaining quantity of water was found barely 3° colder than the surrounding air.

It is but lately that liquor coolers have been manufactured in this country, and they are at present to be found in most of the earthenware shops in and about London. These are cylindrical vessels, about six inches in diameter, and about a foot high. It is directed to keep one of these vessels entirely immersed in water during one hour. The vessel, being then removed, in that moat rate, without putting any water in it, a bottle of wine, &c. must be placed in it, and this is laid to be cooled by the evaporation of that quantity of water, which the substance of the vessel had imbibed whilst it remained under water. Upon trial, however, it appears that the actual refrigeration which is obtained by means of one of these vessels, seldom amounts to two or three degrees; and that, of course, a bottle of wine may be cooled much more effectually by placing it in a pail of water fresh drawn from a pretty deep well or pump; which may be renewed at intervals. Indeed, considering the form of these coolers, also that the fides of them are at a considerable distance from the surface of the bottle, and the ambient air has a free access to both, it is hardly to be expected that any sensible advantage should be obtained from them.

In India the action of evaporation is used not only for cooling liquors, but likewise for cooling apartments, and the effect, by the testimony of those persons who have experienced it, is said to be very remarkable. The method, (which, however, is practicable only when a dry wind blows,) is as follows. That door of the apartment which is opposite to the wind, and through which the wind enters, is stripped up with a peculiar sort of screen or curtain, which fits it exactly. This screen consists of two surfaces or gratings of bamboo, situated parallel to each other, and about three or four inches apart; then the space between these external surfaces is filled up in a loose manner with the roots of a sweet-scented grass. In short the construction of this screen is calculated to admit the air not in a body, but divided through a vast number of passages. Two men are placed on the outside, each having a goat's skin filled with water, which they keep continually sprinkling upon the screen. A constant and copious evaporation is of course kept up, which previously cools the adjoining room to a very remarkable degree. By this means the temperature of the room has sometimes been lowered upwards of 15°.

Amongst those cooling processes which depend upon the expansion of bodies, that which arises from the expansion of air must not be forgotten; but this is by no means a practicable, we shall barely mention it in this place. The condensation and expansion of air produce the effects which have been mentioned above; viz. the former is attended with an extraction of heat, and the latter with an absorption of it; hence the contiguous bodies are heated by the former, and are cooled by the latter. When air is suddenly condensed, (see Condenser, and Condensation,) the heat which is extricated from it, has been found capable of setting fire to light combustible bodies; and when the air is rarefied either by means of an air-pump, or by liberating it from a vessel, in which it has been condensed; the cold it produces has sometimes been found to lower the thermometer several degrees below the freezing point.

The last method of cooling which remains to be described, is obtained by the solution of salts. That certain saline substances, whilst diffusing in water, or in acids, would generate a considerable degree of refrigeration, and especially that the solution of sal ammoniac would lower the thermometer down to the freezing point, has been long known; but, within the last 15 or 20 years, the subject has received wonderful improvements, in consequence of the experiments instituted by various ingenious persons; and, especially from the laborsious investigations, and successful experiments of Mr. Walker of Oxford, who has examined the cooling powers of a vast number of saline substances both single and mixed; and has been able to freeze quicksilver at Oxford in the middle of summer, merely by the solution of salts. His interesting experiments, and his various freezing mixtures, will be found described under the article Freezing.

A vast number of salts and saline mixtures may be used for cooling liquors; but the most advantageous are those which, after solution, may be recovered by means of evaporation, so as to render them useful for a second refrigeration, a third, and so forth. Yet the price of most of those salts in Europe, the trouble of recovering them from the solution, and pounding them in order to render them fit for another cooling operation, have not rendered this method common in this part of the world; especially where other easier methods are practicable. So that in fact the cooling power of saline solutions is mostly used for particular experiments by the European philosophers, especially when a very powerful freezing mixture is required. In India, where nitre is very cheap, and the heat of the climate prompts the inhabitants eagerly to adopt every possible method of cooling, the practice of cooling liquors, by means of the solution of nitre in water, is very common. For this purpose, the wine, the water, or any other liquor, is put into a metallic bottle, generally a pewter one, having a pretty long neck. A tub is partly filled with water, and a quantity of nitre is thrown in it; then the operator holds the bottle by the upper end of its long neck, and gently moves it about the saline solution, and thus cools the liquor in it to a very considerable degree. As salts will produce cold only during their solution, therefore when the first quantity of nitre has been thoroughly diffused in the above process, more nitre must be added; and when the water is completely saturated, so as not to be capable of diffusing more salt, then the bottle must be removed to another tub with a fresh saline mixture. The nitre might afterwards be easily recovered merely by exposing the solution, in shallow pans, to the hot rays of the sun in that country; this economical plan, however, does not as yet seem to have been adopted.

The salts which might be used for the purpose of cooling liquors in this country, or in long voyages, are nitre and sal ammoniac; the other saline substances being either more expensive or not easily recoverable after solution. Of the effects of nitre alone in water enough may be derived from the above described process. Salt ammoniac by itself gradually
COOLING.

The method of determining high degrees of heat, from the progress of cooling, depends upon the following observation. Sir Isaac Newton, considering the progress of cooling, was led to suppose, that the heat left by any body originally at a high temperature, in equal small portions of time, is as the heat existing in it; (reckoning the heat in the body, equal to its excess above that of the surrounding atmosphere,) that is, taking the times in arithmetical progression. The portions of heat left in those times would be in a geometrical one. The truth of this supposition has been sufficiently shown by subsequent experiments, the result of which has not differed much from the theoretical determinations. Hence we have the following practical rule for determining the high temperature to which a body has been exposed, from its subsequent progress of cooling.

Measure the time in minutes that elapses from the hottest state of the body (which is the degree sought,) to such a state of lower temperature as will allow the application of a common thermometer to the body in question, and call this number of degrees A; then having applied the thermometer, let down the temperature, which is indicated by the scale, at the expiration of each successive minute, until you have obtained three or four terms of the series, which, as has been said above, will be found to be a geometrical one (omitting, however, trifling differences.) Now, since from these few terms it is easy to determine any other terms of the same series, by the well known arithmetical rules; find for many terms of the series ascending, as are equal to the number of units in A; and the last term of the series, thus found, will be the degree of temperature of the body in its hottest state. An example will easily illustrate the application of this rule. Suppose it is required to determine the temperature of a piece of red-hot iron at the time that it came out of the forge. Look at the watch the moment the iron is taken out of the fire, and note the minute. Find by trials when the thermometer may be safely applied to the iron, viz., when the heat is not sufficient to rarify the mercury of the thermometer beyond the limit of its scale, and when this is practicable, observe the temperature of the iron, and the corresponding time as indicated by the watch. Suppose, for instance, that when the temperature of the iron was 350°, four minutes had elapsed since the commencement of the observation; therefore in this experiment A is equal to 4. Let the thermometer continue in contact with the iron, and when one minute more has elapsed, let the temperature be 125°. When another minute has elapsed, let the temperature be 62½ degrees; and after this, the observation needs not be continued. Now we have three successive terms of a geometrical series; viz. 350, 125, 62½; from which four more terms of the series are to be found, (since A was found equal to 4.) and the last of those terms is the number of degrees indicating the temperature sought. By dividing 350 by 125, or the latter by 62½, we have the quotient 2, (or nearly 2) which is the multiplier of the series, and therefore multiplying 250 by 2, we have the term 500, which multiplied by 2, gives the next term 1000, which multiplied by 2, gives 2000; and lastly this term multiplied by 2, gives the fourth term 4000; hence we conclude, that when the iron was taken out of the furnace, its temperature was 4000 degrees. The last term of the series may be found out by other means, but we have chosen the easiest, for the convenience of all readers. The two series are annexed.

8 Time
COOLING.

Time elapsed in minutes.  Corresponding heat.

<table>
<thead>
<tr>
<th>Time (minutes)</th>
<th>Heat (°F)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>40°00</td>
</tr>
<tr>
<td>1</td>
<td>80°00</td>
</tr>
<tr>
<td>2</td>
<td>100°00</td>
</tr>
<tr>
<td>3</td>
<td>120°00</td>
</tr>
<tr>
<td>4</td>
<td>125°00</td>
</tr>
<tr>
<td>5</td>
<td>135°00</td>
</tr>
<tr>
<td>6</td>
<td>142°00</td>
</tr>
</tbody>
</table>

Instead of minutes, the intervals of time may be half minutes, or hours, or, in short, of any other denomination; provided they be equal.

Cooling of liquors in Domestic Economy, is a practice of ancient origin, and of general prevalence in warm countries, and during the heat of summer, even in colder climates. This practice, as some have thought, is referred to by Solomon, in the book of Proverbs (ch. xxv. 13.); but however this be, evidences of it are very numerous in the works of the Greeks and Romans. Ice and snow were generally used for this purpose, and repositories were contrived for keeping these cooling materials. That the snow was preserved in pits or trenches is asserted by many; particularly by Seneca (Quæst. Natur. iv. 13) and Pliny (H. N. i. xix. 4.). When Alexander the Great besieged the city of Petra, he caused thirty trenches to be dug, and filled with snow, which was covered with oak-branches, and which was kept in that manner for a long time (Alexangi Deipnous. iii. p. 124.) Plutarch says (Sympoi. vi. Quæst. 6.), that a covering of chaff and coarse cloth is sufficient; and a like method is now practiced in Portugal. Where the snow has been collected in a deep gulf, some graves or green beds, covered with dung from the sheep-pens, are thrown over it; and under them it is so well preserved, that it is tint through the whole summer for the distance of 60 Spanish miles to Lisbon. When the ancients wished to have cooling liquors, they either drank the melted snow, or put some of it in their wine, or they placed jars filled with wine in the snow, and suffered it to cool there as long as they thought proper. The dissipated and luxurious Heliogabalus cau8ed whole mounts of snow to be heaped up in summer to cool the air (Lamprid. Vit. Heliogab. c. 23.) That ice was also preferred for the like purpose is probable from the testimony of various authors, Pliny, Seneca, &c.; but it appears not to have been used so much in warm countries as in the northern. At present snow is employed in Italy, Spain, Portugal; but in Persia, ice. The art of cooling water without snow or ice was soon forgotten to mankind, by observing, that it became cold more speedily when it had been previously boiled, or at least warmed, and then put in a vessel among snow, or in a place much exposed to the air. Pliny (H. N. i. xxxi. 3. 23.) seems to ascribe this to the invention of Nero; and a jocular expression of Suetonius (Vit. Ner. c. 48.) renders it probable, that he was fond of water thus cooled. But this method was much more ancient than Nero; for it seems to have been known to Hippocrates (De Morb. Vulgar. lib. vi. 4.); and Aristotle was acquainted with it; for he says (Meteorol. i. cap. 12.) that some were accustomed, when they wished water to become soon cold, to place it first in the sun and suffer it to become warm. He relates also, that the fishermen near the Black Sea poured boiling water over the reeds, which they used in fishing on the ice, to cause them to freeze sooner. See also Galen, in lib. vi. Hippocrat. De Morb. Vulgar. Comment. 4. 10. Athenæus remarks (Deipnous. iii.) that the pitchers filled with water, which had become warm by standing through the whole day in the sun, were kept continually wet during the night, by fountains defined to that office, and in the morning they were bound round with raph. In the island Cithæon, water which had become warm in the day-time was put into earthen jars, and deposited in a cool corner, where it became as cold as snow. From these facts it appears to have been a general opinion, that water which had been warmed or boiled, was soon it cooled, and acquired a greater degree of refrigeration. The same opinion prevails at present in the southern countries of Asia, and persons there let their water boil before they expose it to the air to cool. The experiments, however, that have been made on this subject, have given different results. Beckmann (ub infra) inclines to the opinion, that the cooling of water in ancient times was not to be ascribed so much to the boiling as to the keeping of the jars continually wet, and to the air to which they were exposed. See Congelation and Freezing, and also the preceding article.

Another method of cooling water seems to have been known to Plutarch. It consisted in throwing into it small pebbles or plates of lead (Sympoi. vi. 3.).

The practice of cooling liquors, at the tables of the great, was not usual in any country besides Italy and the neighbouring states, before the end of the 16th century. In the middle of that century, there were no ice-cellars in France. Towards the end of this century, under the reign of Henry III., the use of snow must have been well known at the French court, though it appears that it was confided by the people as a mark of excessive and effeminate luxury. Towards the end of the 17th century, this luxury must have been very common in France. At that period there were many who dealt in snow and ice; and that was a free trade which every one might carry on; but soon after government forced out a monopoly of cooling waters.

The method of cooling liquors by placing them in water, in which salt-petre has been dissolved, could not be known to the ancients, because they were unacquainted with that salt. This property of salt-petre was first discovered in the first half of the 16th century; and it was not remarked till a long period afterwards that it belongs also to other salts. The Italians were the first persons by whom it was employed; and about the year 1550, all the water, as well as the wine, drunk at the tables of the great and opulent families at Rome, was cooled in this manner. Towards the end of the 16th century this method of cooling liquors was well known. Mr. Beckmann says, that he cannot determine who first conceived the idea of mixing snow or ice with salt-petre, and other salts, which increase the cold so much, that a vessel filled with water, placed in that mixture, is congealed into a solid mass of ice, that may be used on the table, but the earliest account of it he has been able to find is a work of Latinus Tancredus, a physician and professor at Naples, who, in his book, "De Fame et Siti," published in 1667, speaks of this experiment. In 1626 Saint. Sanctorius, in his Commentary on the Works of Avicenna, relates, that, in the presence of many spectators, he had converted wine into ice, not by a mixture of snow and salt-petre, but by snow and common salt. When the salt, he says, was equal to a third part of the snow, the cold was three times as strong as when snow was used alone. Lord Bacon, who died in 1626, says, that a new method had been found out of bringing snow and ice to such a degree of cold, by means of salt-petre, as to make water freeze. This, he tells us, can be done also with common salt; and he adds, that in warm countries, where snow was not to be found, people made ice with salt-petre alone; but that he had never tried the experiment. Mr. Boyle, who died in 1691, made experiments with various kinds of...
kinds of salt; and he describes, how, by means of salt, a piece of ice may be frozen to another solid body. Des Cartes says, that, in his time, this was a well-known phenomenon, but highly worthy of attention. Since that period, the art of making ice has been mentioned in the writings of all philosophers, where they treated on heat and cold. Towards the end of the 17th century, the French began to conceal all kinds of well-taught juices, which were served up as refreshments at the tables of the great and wealthy. This was a grand invention for the art of cookery, and afterwards it became common, especially in the last century, and since that time the confectioners have universally practised it. Beckmann's Hist. of Inventions, vol. ii. See Freezing and Ice.

Cooling medicines, those which have a tendency to diminish febrial heat, to alloy thirst, and to lessen the activity of the circulation. They consist chiefly of diuretics, acids, and neutral salts. With the use of these a cooling regimen is commonly combined, which consists in a free employment of thin watery drinks, and a forbearance from every thing stimulating; such as animal food and fermented or spirituous liquors. Occasional laxatives and gentle diaphoretics contribute to the same purpose. See Refrigerants.

COOLOU, in Geography, a port of Chincoteagery; 5 miles N. of Teling-Hotun.

COOLLO, a town of Hindooollan, in the country of Orija; 39 miles S.W. of Cattack.

COOLOOME, an Indian town, situated on the W. side of Talapoofe river. See Talapose.

COOM, a term for foot that gathers over an oven's mouth: also for that black greaty fulbustance which works out of the wheels of carriages, and with which the axle-trees and boxes have been daubed or smeared over, in order to lessen friction, and make them run easy.

Coom, or foot, is sometimes used in medicine, infused in wine with other ingredients, as an antiphylactic, and against palpitations of the heart, &c.

The spirit of foot is also used for the same intentions, and in cephalic cases.

COOMBE, or Carnack of cubear, according to the 9th and 13th Henry III., 12th Henry VII., &c. was, 250,000 troy = 210,661 lb. avoirdupois = 2 striking = 16 pecks = 32 gallons = 256 pints or pounds.

COOMBE, Com, or sack of corn, is 2 long striking = 4 Winchester bushels = 16 pecks = 32 dry gallons = 128 dry quarts = 256 dry pints = 860,16 cubic inches = 4.97 cubic feet = 1.843624 cubic yards = 17,32142 cubic links. In some of the few districts it consists of 4 bushels, and each bushel of 8 gallons and a quart.

COOMBE HILL Canal, in Geography, is a short canal, in Gloucestershire, whose principal trade consists in carrying coal from the pits to the Severn river. See Canal.

COOMINGS, in Naval Architecture. See Coomings.

COMTAH, in Geography, a town of Hindooollan, in the country of Bear; 45 miles N.E. of Nagpoor.

COOP, in Rural Economy, a provincial term, sometimes applied to a tumblir or cart enclosed with boards, to carry dung, sand, grains, &c. See Cart.

Coop, also signifies a pen, or enclosed place, where lambs, poultry, &c. are shut up, to be fed or fattened.

Coop's Town, in Geography, a town of America in the state of Maryland, and county of Harford; 12 miles N.W. of Harford, and 22 north-easterly of Baltimore.

COOPA, a town of Persia, in the province of Irak; 30 miles E.N.E. of Ispahan.

COOPER, SAMUEL, in Biography, a miniature painter, whose works are deservedly held in the highest estimation. He was born in London in 1699, and was instructed by his uncle, Hokins, who was himself a finner of considerable merit. The scholar, however, soon surpassed his master in the variety of his nuts, the clearness of his caricatures, and the beautiful management of his hair. The works of Vandyke were the models upon which he formed his style; and so perfect, yet to bold, is the imitation, that were some of Cooper's pictures magnified to the size of life, they would scarcely lose by their comparison with the finest heads of the great Flemish master. He was the first who gave to his miniatures the freedom and strength of oil painting; and had his skill in drawing the other parts of the body been equal to that which he evinced in the face, his works might have challenged the most scrupulous eye of criticism. He seems, however, to have been conscious of his defects, and, probably on that account, left many of his finest pictures with the neck and arms unfinished. It would far exceed our present limits to enumerate even the half of Cooper's works. His portrait of Oliver Cromwell, which was lately in the possession of Sir Thomas Frankland, a defendant of Oliver, is described as a master-piece of character, and was engraved by Vertue. Mr. Wulpole mentions some of his other productions in the closet of queen Caroline, at Kensington; particularly a fine portrait of general Monk, of which the head only is finished. He was employed some time by the court of France, and lived several years in Holland. He died in London, May 5th, 1724, and was buried in Pancras church, where a monument is erected to his memory. Wulpole's Anecdotes.

COOPER, ALEXANDER, was the brother of the preceding artist, and, with him, received instruction in miniature painting from their uncle, Hokins. We learn from Wulpole, that Alexander painted landscapes and figures in water colours, as well as portraits. The fame author mentions the story of Diana and Actæon by this master, at Burleigh. He resided some time at Amsterdam, and ultimately entered into the service of queen Chriflina. Wulpole's Anecdotes.

COOPER, RICHARD, a painter and engraver, a resident of Edinburgh, who flourished in 1730. Amongst other works, he engraved the portrait of William Caribares, and that of Andrea Allen, the painter, after William Robinson—Mr. Strutt mentions another Richard Cooper, who resided at London, and flourished in 1768. Like the former artist, he engraved portraits. One of his half prints represents the five children of Charles I., accompanied by a great dog, from a picture of Vandyke. Other artists of the name of Cooper are mentioned by Heinecke. Strutt.

COOPER, or COUPER, THOMAS, a learned prelate of the sixteenth century, was born at Oxford about the year 1517, and educated in grammar learning in the school joining to St. Mary Magdalen College; and afterwards studied in that college, where he took the several degrees, and succeeded to a fellowship. When queen Mary came to the throne, he declined the purports of divinity for the study of phylic, being a found protestant in principle. Upon the death of that sovereign, he resumed his former studies, and became a frequent and celebrated preacher. He was made dean of Christ-Church in Oxford, and was for several years vice-chancellor of the university. In 1569, he was inducted to the deanery of Gloucester; and, in the following February, was consecrated bishop of Lincoln. His distinguished merit and great zeal, in the performance of the duties of his high office, recommended him to the sovereign's favour, who caused him to be translated, in 1584, to the rich bishopric of Winchester, where he became celebrated for his learning, and for the exemplariness of his conduct. Soon after his consecration,
Cooper, Anthony Ashley, first earl of Shaftesbury, one of the ablest persons, and most distinguished ministers of the 17th century, was son of Sir John Cooper of Rockboum, in the county of Southampton, bart., by Anne, daughter and sole heiress of Sir Anthony Ashley of Winborne St. Giles, in the county of Dorset, from whom he inherited an estate of 8000l. per annum. He was born at Winborne, July 22, 1624, and educated with the greatest care under the eye of his parents, during his infancy, in which he discovered such talents, that extraordinary things were predicted of him, while he was yet a boy. Before he was ten years of age, he had the misfortune to lose his father; at fifteen he became a fellow-commoner of Exeter college Oxford, under the tuition of the celebrated Dr. Prideaux, who was then rector of it. At the university, where he remained but two years, he obtained a character for great affability, and extraordinary genius. From Oxford he removed to Lincoln's Inn for the study of the law, and before he had completed his nineteenth year, he was chosen member of parliament for Tewksbury. This was in the year 1642; and, at the commencement of the civil war, he adhered to the king's side, though he was always a friend to peace, and thought conciliations should be made by both parties to attain it. To accomplish this great object, it is said by the great Mr. Locke, that he repaired to the king at Oxford, and proposed a method of putting an end to the war, by treating with the parliamentary garrisons, and promising them annuity for the pint, and full security for liberty in the future. The plan did not succeed; and when Sir Ashley found himself suspected by the court, and that his person was in considerable danger, he went over to the parliament party, by whom he was kindly received as well on account of his great talents, as for the influence which his property must create. He raised forces in Dorsetshire, and in 1644 he rendered the cause in which he acted some very signal services. He seems even at this period to have been looked up to by the royal party, since he was trusted with private negotiations between the king and Duke of York, lord Hainis, at the treaty of Uxbridge, for which he was afterwards questioned, and severely threatened, in parliament. After the battle of Naseby, he attempted to check the overgrown power of parliament, by exciting the "Club men," a body of people in several counties, encouraged to take up arms, to declare themselves as a middle party, and to insist upon a fort of treaty by which they might be reftored to the benefits of the law, and the protection of the constitution. The plan was in some measure executed; Fairfax received their proposals, and promised to communicate them to parliament, but Cromwell, and other leaders of that party, perceiving that no time was to be lost, attacked the club-men without mercy, killed great numbers of them, and dispersed the rest. The scheme was abandoned, but the author of it contrived fo as not only to involve himself in their fate, but to obtain shortly after the office of high fheriff of the county of Wilthire. Owing either to his great influence in the country, or to the warmness of his own well-processed schemes, he was elected a member of the convention, which succeeded to the long parliament abolished by Cromwell; and, in 1654, we find him a member of parliament, and one of those who protested against the tyrannical government of Cromwell. He was on other occasions a strong, though perhaps neither a steady nor uniform, opponent of the protector, as he ceased himself to be fryled. See CROMWELL. Sir Anthony was nevertheless chosen by the protector to be one of his privy council; and it has been asserted, that he even fought an alliance by marriage with the baronet's daughter. Dr. Kippis, however, who investigated the matter, gives no credit to this part of the charge. When Richard Cromwell was deposed, Sir Anthony was appointed by the rump parliament one of the council of state, and a commissioner for the managing army, although, it is now well known, that he was at the time engaged in a plan to restore Charles II. to the throne, notwithstanding the strong protestations which he made of his innocence when questioned on the subject, by which he obtained an acquittal. Like other discrediting men, he foresaw, from existing circumstances, that a change in favour of monarchy must eventually take place, and therefore he took care to secure a claim of merit in the restoration, which he promoted with great zeal and ability, when he perceived an evident tendency to that event. In 1660, he was a member of the healing parliament, and one of twelve who were deputed to invite the return of the king; who, in grateful remembrance of his services, made him a privy councilor; gave him a commission for the trial of the regicides; and, in the course of a year, raised him to the rank of peer of the realm, by the title of baron Ashley of Winborne St. Giles. He was soon after appointed chancellor and under-treasurer of the exchequer, and, upon the death of lord Southampton, one of the lords commissioners of the treasury. He was a member of the celebrated cabal minority, in which, from his superior talents and forcible eloquence, he took a decisive lead. He continued in the councils and confidence of the king his master, during the happiest part of his reign, and stood as high in his favour as any of his ministers. He was afterwards appointed to the lord lieutenancy of the county of Dorset, and on the
twenty-third of April 1672, was created baron Cooper of Pawlet, and earl of Shaftesbury. In the following November, he was raised to the highest office of state, viz. that of lord chancellor of England, the duties of which station he executed with equal ability and integrity. In his other capacities, as a minister and privy counsellor, he has been variously defcried; but he is allowed, on all hands, to have been one of the ablest men, and one of the most accomplished orators that have adorned this country. “The short time,” says one of his biographers, “that he was at the helm, was a厮on of it and tempels, and it is but doing him strict justice to say, that they could neither affright nor disturb him. Whatever he did, he did with his might, and there was a spirit and dignity in his administration, which that government could never recover after he left it. He was the soul and genius of the ministry while he made a part of it; but whether he did not care things too high, and out of the reach of all other capacities but his own, it would favour of rashness to determine.” Some historians attribute to him the arbitrary counsel of shutting up the exchequer, while others affirm that he opposed it with all his power, and drew up a paper of reasons against it. It is certain that he was the author of an sworn promotor of the declaration for liberty of conscience, which, though intended principally to favour the Papists, probably agreed with his own real judgment, as a decided friend to religious toleration. It is generally admitted that he had no concern in the disgraceful treaty with Lewis XIV., of which the main object was to render Charles a penitent on the French monarch; but he was a firm supporter of the Dutch war, and was guilty of advising the illegal measure of using writs for the election of members of parliament, during a recess, and abusing the influence of the crown to procure returns in favour of the court. He had not been more than a year in possession of the seals, when he manifested hostility to the principles which governed the Stuart family; so that the duke of York became his enemy, and at length in Nov. 1673 got him removed from his office. After he had quitted the court, he continued to make a great figure in parliament, and for his warmth in maintaining that a prorogation for fifteen months was equal to a dissolution, he was committed to the tower, where he remained a prisoner full thirteen months, when he submitted and was released, and the precedent made in his case was afterward reversed. Previously to this, he had shown himself a friend to civil and religious liberty, by opposing the tell-bill introduced into the house of peers by lord Danby, and on this business, he failed to have distinguished himself more than he had ever done. He managed the opposition to lord Danby’s administration with so much dexterity and vigour, that it was found absolutely impossible to do any thing effectually in parliament, without chagrifying the JElms which then prevailed. The king accordingly deserted all the privy council at once, and formed a new one, making lord Shaftesbury the lord president. He had, however, already drawn upon himself the implacable hatred of the duke of York, by readily promoting, if not originally inventing, the project of an exclusion bill.” To him also is imputed the contrivance of the Popish plot in 1678; which, if it were not a fiction of his own, was urged by him with the greatest virulence against the court party, so as to be the means of throwing out lord Danby’s administration; and there is no doubt that he was the author and promoter of all the perfections which followed on this business, as well in the inferior courts as in parliament, with a view of quashing the popish party entirely, and of excluding the duke from the succession, which were points he had most at heart, and which he purposed with an indefensible severity. Amidst many violent and very unjust proceedings, he was the author of a measure of formal national benefit, the passing of the “Habeas Corpus act,” to the protection of which he had occasion to appeal shortly after, for his own personal freedom. His new employment was short-lived, as he was dismissed after holding it little more than five months; and some of the practices to which he had recourse against the papists, were turned against himself. He was applied to by a man pretending to make discoveries relating to the popish plot, and the murder of Sir Edmundbury Godfrey, provided that for this service he might obtain a pardon. The man was conducted to the privy council; but instead of giving the information expected, he charged the noble earl with endeavouring to suborn him. Upon this information his lordship was apprehended on the 2d of July 1681, and after an examination by his majesty in council, he was committed to the tower, where he remained four months. Notwithstanding he took every legal method to obtain a trial, or to be admitted to bail, according to the principles of the habeas corpus act. At length, on the 24th of October, a bill was presented to the grand jury for the sessions house in the Old Bailey, against his lordship, for high treason. Witnesses were brought against him, but their characters were too infamous to permit their evidence to have the smallest degree of weight. Considerable stress was laid upon the draught of an association found in his study, which, however, was neither written nor signed by the noble earl; and the jury, after some consideration, threw out the bill, and he was acquitted, amidst the acclamations of the people. A medal was struck on the occasion, which was the cause of a very bitter satirical poem, from the pen of Dryden, which had been pernicious Shaftesbury, as the great counsellor of rebellion, in his “Abolition and Achitophel.”

As soon as he was at liberty, lord Shaftesbury endeavoured to vindicate himself by law, and brought an action against a peron for speaking of him as a traitor: this he thought proper to discontinue before it came to trial. For many years he had resided at Thanet-house in Aldergate-street; but finding his health decay, his spirits declining, and the times becoming more serious, he withdrew into Holland, where he arrived in November 1682, and in the following January he died at Amsterdam in the sixty-second year of his age. His body being embalmed was transported to England, and buried with his ancestors, at Winborne St. Giles, where much has been written concerning the character and conduct of this public man. As a public man, he was, says Dryden, “kippis, guilty of manifold inconsistencies, and submitted to shameful compliances. “There were, however,” adds the same candid and excellent biographer, “three points in which, through the usual tenor of his life, the earl of Shaftesbury was entitled to applause. These were, his attention to the protection and advancement of trade and commerce; his endeavours to counteract the growing power of France; and his attachment to the cause of religious liberty. He wrote an essay on toleration, still preserved in the family, which was evidently the ground work of Mr. Locke’s admirable letters on that subject. Several of the measures, proposed and supported by him, were preparatory to those that were adopted at the Revolution, and he contributed, by his ardour, to raise and animate the spirit which, in the end produced the event, so that amidst all his obliquities and faults, he deserves to be celebrated, as having been no small benefactor to the free constitution of England.” He left in MS. a history of his own times; and some of his speeches have been published. He was thrice married, but left only one son, who succeeded
in his estates and titles, and who died in November 1699, and was succeeded by Anthony his son and heir, of whom we are now to give an account.

COOPER, Anthony Ashley, third earl of Shaftesbury, was born Feb. 26, 1670-71, at Exeter-hou'se, London, which was at that time the town-residence of his grandfather, who undertook the superintendence of his education. He first entered into the care of the lord president of the name of Birch, under whom he made such rapid advances in the Greek and Latin languages, as to be able to read the common authors in each before he was eleven years old. He was then placed in a private school, where he continued till the death of his grandfather, when he was sent to Winchester; where, on account of the infirmities which afflicted, through the hatred borne to his grandfather's memory by the friends to arbitrary power, he remained but a short time, and, in 1686, he commenced his travels under the care of a well qualified tutor. With him he spent much time in France and Italy, improving himself in the languages and accomplishments of those countries, and laying the foundation of the knowledge and taste for which his own subsequent writings were justly celebrated. He returned to England in 1689, and was offered a seat in parliament, which for the present he declined, wishing rather to employ all his leisure in the improvement of his mind, and in extending his knowledge on subjects of the greatest importance. In these views he succeeded, and laid a foundation in learning which was accurate, extensive, and truly liberal. After pursuing the studies congenial to his temper, with much ardour and almost unabating diligence, for nearly five years, he was elected member of parliament for Poole. In this high station he shortly had an opportunity of expressing that attachment to liberty, by which he was distinguished through the whole of his life, and of conciliating the house to the object which he had in view. The occasion was the introduction of a bill for granting, among other things, the aid of counsel to persons indicted for high-treason. Lord Ashley had prepared a speech for the purpose, but when the moment came, in which he was to deliver it, he was utterly unable to proceed. After a short pause, he addaddressed the speaker. "If I, sir, who only rise to give an opinion on the bill now depending, am so confounded, that I am unable to express the least of what I proposed to say, what must be the condition of that man, who, without any affliance, is pleading for his life, and under the apprehension of being deprived of it?" This happy turn of thought, so appropriate to the occasion, is supposed to have contributed more than any of the arguments which were urged in obtaining the justice for which he pleaded. The necessity of this wise and humane law has been of late years amply manifested by the conduct of certain great law officers, who took the very moderate space of seven, nine, and eleven hours in opening cules of high-treason. During the remainder of that parliament, Lord Ashley was indisputable in the promotion and support of every measure in favour of liberty, without regard to the person by whom it was introduced, influenced unquestionably by an attention to the public good, without feeling the palate motives which too frequently actuate political men. At the dissolution in 1696, he resigned his pretensions to a seat in the house, on account of ill health, and with a view also of securing more time for literary pursuits. He went to Holland under the assumed character of a student in physic: here he cultivated an acquaintance with Bayle, Le Clerc, and other men of celebrity, and it was not till a short time before he left the country that he made his name known. Before his lordship's return an imperfect and surreptitious edition of his "Enquiry concerning Virtue," was published in a most unhandsome manner by Mr. John Toland, who, says Dr. Kippis, in this transactiion, repaid with ingratitude a very generous benefactor. His lordship bought up the edition, and set about completing the treatise, which afterwards appeared as the second volume of the "Characters." Soon after Lord Ashley's return to England, he became, by the death of his father, the earl of Shaftesbury, but he did not take his seat in the house of peers till the beginning of the year 1700-1, when his friend, Lord Somers, sent a messenger to acquaint him that his presence was necessary, on account of the Partition-treaty, which, at that time, was under the consideration of parliament. During the remainder of the session he attended his duty as frequently as the state of his health permitted, zealously supporting the measures of King William, who was, at that period, negotiating the grand alliance. That sovereign regarded the support of Lord Shaftesbury so highly, that he wished to appoint him secretary of state. This honour his health did not allow him to accept; but he was nevertheless affianched in rendering to his majesty advice on every important occasion. Soon after the accession of queen Anne, Lord Shaftesbury retired from public life, being no longer a friend to the measures of the court. Ministers now took from him the vice-admiralty of the county of Dorset, which had been held by his family for three successive generations. He went to Holland a second time, where he spent two years among the learned connections, which he had already formed in that country. About this period the French prophets having excited a considerable disturbance, in the nation, by their enthusiastic extravagances; some great men recommended professions and punishments as the only methods of suppressing them; these lord Shaftesbury was decidedly inimical, thinking that such measures would increase rather than cure the malady. This was the origin of his "Letter on Enthusiasm," which he sent to lord Somers, then president of the council, which, being approved by that nobleman and others, was published in 1708, though without the name of the author, or that of the person to whom it was addressed. In the following year he published his "Moralists," a philosophical rhapsody, being a recital of certain conversations on natural and moral subjects; and in a few months afterwards his "Senius Communis; an Essay upon the Freedom of Wit and Humour, in a Letter to a Friend." In the same year he married Miss Jane Ewer, the youngest daughter of Thomas Ewer, esq. of Lee, in Hertfordshire. In forming this connection, it should seem that his lordship was principally influenced by the solicitations of his friends, rather than from any inclination of his own, or high expectations of the happiness of that life. Letters to this effect are preserved in the Biographia Britannica. By his lady, to whom he was previously related, he had an only son Anthony, afterwards earl of Shaftesbury.

In 1710 the noble lord published his "Soliqay, or Advice to an Author;" after which his health obliged him to try the effects of a warmer climate. He accordingly, in 1711, passed through France and Piedmont, and fixed his residence at Naples, where he died on the 4th of February, 1712-13, at the early age of forty-two. During his abode at Naples, he finished his "Judgment of Hercules," and the "Letter concerning Delight," which have since been added to the "Characters." It was in 1711 that the first edition was published of all the Characters, in the same order in which they now stand: but this publication not being entirely to his lordship's satisfaction, he chiefly employed his time abroad in preparing his writings for a more elegant edition, which was given to the world soon after
after his decease, in the year 1712. The several engravings, that were then first interwoven through the volumes, were all invented by himself, and designed under his immediate inspection. The impression of the "Characteristics of Men, Manners, Opinions, and Times," in 3 vols. 8vo., contains the whole of his works which he intended to submit to the judgment of the public. In the year 1716, some of his private letters upon philosophical and theological subjects were published, under the title of "Several Letters written by a noble Lord to a young Man at the University," and in 1721, another collection of the same kind appeared, entitled "Letters from the Right Honourable the late Earl of Shaftesbury to Robert Mofleworth, esq. now Lord Vifcount of that Name; with two Letters written by the late Sir John Cropley: to which is prefixed, a large Introduction by the Editor." That editor, says the candid biographer already referred to, was Mr. Toland, who, in the present, as well as in the former age, assumed a liberty not very agreeable to the family. In their opinion, as the correspondence was almost entirely of a private nature, it was on that account unfit for public view. It nevertheless felt his lordship's integrity in the most amiable point of light. Lord Shaftesbury also wrote a preface to a volume of Dr. Whicliocote's sermons, published in 1698; and in his Letters to a young Man at the University, expatiates on the merits of Burnet, Hoadly, Tillotson, Barrow, Chillingworth, and Hammond, as the great pillars of the church against fanaticism. But however highly he might eele the labours of modern divines, his principal admiration was directed to the writings of antiquity. These were the constant subjects of his study, and on these his philosophy was built. His favourite books were the moral works of Xenophon, Horace, the Commentaries and Enchiridion of Epictetus, as published by Arrian, and Marcus Antoninus. These authors he always carried with him, in his various excursions; and they are still extant, filled with marginal notes, written in his own hand. It remains now to notice more particularly the writings of lord Shaftesbury, which, by one class of critics, have received the most extravagant applause, and, by another, have been the subjects of indiscriminate condemnation. They have been examined with a critical eye, and in rather an elaborate manner, by Dr. Kippis, to whose article, in the Biographia Britannica, we refer the reader, containing ourselves with a brief outline. Lord Shaftesbury's Letter on Truthfulness was written from excellent motives: it contains many admirable remarks, delivered in a neat and lively strain; but it wants precision; conveys but little information; and contains some exceptionable passages. The same character may be given, with truth and justice, of "The Essay on the Freedom of Wit and Humour," designed to defend the application of ridicule to subjects of speculative inquiry, and among others to religious opinions. His "Scholiary, or Advice to an Author," met with more general approbation. It contains a variety of excellent matter; and what the noble lord has advanced in recommendation of full-examination, and in defence of critics and criticism, is particularly valuable: it is evidently the result of the author's knowledge and refined taste in books, in life, and manners. Lord Shaftesbury's "Enquiry concerning Virtue" obtained more general applause. It is able and finely written, and maintains with great force the important truth, that virtue is the greatest happiness, and vice the greatest misery of men. This work has met with much opposition from those who deduce the principles of virtue from self-love only, and refer the obligation of it solely to the will of God. In this "Enquiry," the noble author appeared in the clofe, the logical, and the didactic form. But in the "Moralists,"
cient family in Nottinghamshire. He received the early part
of his education at Wettin school, and finished his
studies in Trinity College, Cambridge. As an author, his
first work was on the "Power of Harmony," formed on
the model of the "Pleasures of the Imagination." In 1739
he published "The Life of Socrates, collected from the
Memorabilia of Xenophon, and the Dialogues of Plato,"
&c. Learned notes were added by the Rev. J. Jackson of
Leiceter. This work was well received, though at present
it is in no great estimation. In 1753, he gave to the world
"Letters on Taste," which were written in an elegant style,
for which, and for the vivacity in the description, they were
more admired than for accuracy and depth of thought.
Cooper wrote some papers in "The World:--" his other
works are all poetical, of which the principal are, "The
Tomb of Shakspeare, a Vision," "Epistles to the Great,
from Ariostus in Retirement;" "The Call of Ariostus,
an Epistle to Dr. Akenfide;" and "A Translation of
Greffet's Ver Vert." Mr. Cooper was not deficient of
fancy, but his fancy was not always under proper
regulation, and he sometimes failed in the precision of his ideas.
He excelled in the light, easy, and epifatory train. His
sentiments have considerable sameness, being derived from
the Shaffeburian school of philosophy, of which he was a
disciple. He was an active member of the Society for the
Encouragement of Arts, Manufactures, &c.; a diligent
and useful magistrate. He died in 1769, of a fit of
the stone.

Cooper, on board a Ship, the person that looks to the
casks and all other vessels, for beer, water, or any other
liquors. He has a mate under him.

Cooper, in Geography, one of the Bermuda islands.

Cooper, a large and navigable river of America, which
mingles its waters with Ashley river, below Charle-
ton city, in South Carolina. These form a spacious and
convenient harbour, which communicates with the
ocean, just below Sullivan's island, leaving it on the N.
7 miles S.E. of the city. Cooper river is a mile wide at the
ferry, 9 miles above Charleston.

Cooper's Bridge, over the Calder river, on the road
between Huddersfield and Leeds in Yorkfhire, is the place
at which Sir John Ramsden's canal connects with the Calder
and Hibble navigation, which now has become a place of
considerable traffic, in consequence of the junction of the
Huddersfield canal with the other end of Sir John Ramsden's
canal. See Canal.

Cooper's Island, one of the Virginia islands in the Wett
Indies, S. W. of Ginger island, uninhabited; about five
miles long, and from one to two broad. N. lat. 18° 7'.
W. long. 63° 5'.

Cooper's, or De Keuper Island, lies on the north coast of
the island of Java, near Batavia; about 1600 feet
from the island of Oorulf, and about one-third lees in size. The
Dutch company have several warehouses in this island, in
which they chiefly lay up coffee. At its south side there
are two pier-heads, where vessels may load and discharge.
Over the island are interposed several large tamarind trees,
which afford an agreeable shade. The workmen that were
employed here in the day-time, are fetched over at night to
Oorulf, and two are left, as a watch, together with a number
of dogs, so remarkably fierce, that no one dares to set
his foot on the island at night.

Cooper's Island, an island in the Southern Pacific
ocean, near the E. coast of the ile of Georgia. It is a rock
of considerable height, about five miles in circuit, and one
mile from the main. At this isle the main coast takes a
S.W. direction for the space of four or five leagues to a
point, called by Cook "Cape Disappointment." Off that
are three small isles, the southernmost of which is green,
low, and flat, and lies one league from the cape. S. lat.
54° 57'. W. long. 36° 4'.

Cooper's Town, a small town, and township of America,
in the state of New York and county of Otsego. It is
the compact part of the township of Otsego, and the chief
town of the country round lake Otsego. It is pleasantly
situated at the S. W. end of the lake, on its banks, and the
outlet: 12 miles N.W. of Cherry valley, and 73 W. of
Albany. It has a court-house, gaol, and academy. In
1789 it had only three houses; in 1791 it contained 292
inhabitants; and in 1795, 50 houses had been erected on
an improved plan, regularly laid out in squares. N. lat.
42° 44'. W. long. 74° 49'.

Cooper's Town, a town of Pennsylvania, situated on the
Susquehanna river. In 1735 this was a wilderness; but in
nine years after, it contained 1800 inhabitants, a large and
handsome church, a market-house, a library of 1200
volumes, and an academy of 64 scholars. Four hundred and
seventy pipes were laid under ground for the purpose
of bringing water from Well mountain, and conducting it to
every house in the town.

CO-OPERATE, to, in a Military Sense, is to carry a
well-directed plan into execution in such a manner, that the
troops or forces, how much forever divided, may act at one
time, on one principle, and towards one end.

CO-OPERATOR, derived from con, and opera, labour,
denotes any cause, natural or supernatural, which concurs
with another to the production of an effect. Thus, nature
and medicine co-operate in the cure of disorders; and the
will of man concurs with the grace of God in the perform-
ance of good works.

CO-OPERIE PALLIO. See Pallio.

CO-OPERERS, Company of, See Company. Coopers are
enjoined to make their vehills of feasuable wood, and to
mark them with their own marks, on pain of forfeiting
36. 4d.; and the contents of vessels are to be observed under
a like penalty, so that the beer barrel shall contain 36
gallons, a ciderkin 18, a frinck 9, &c. The warehous of
the Coopers' company in London, with an officer of the
mayor, are to search all vehills for ale, beer, and foap to be fold there,
and to mark those that are right; and they may burn the
others: and if any cooper diminish a vehill by taking out
the head, or any one of its favel, it shall be burnt, and the

CO-OPERURA, in Antiquity, a thicket or covert of
wood. Chart. de Farel. cap. 12.

CO-OP-TATION, derived from co-opto. I choose, sig-
ifies the admission of members into any college or fociety.
Thus it was anecdotely applied to the choice of the augurs
and pontiffs; and in modern times, to an extraordinary no-
mination and election of persons of disinguished merit into
a learned fociety.

CO-ORDINATE, something of equal order, rank, or
degree, with another. CO-ORDINATION, in respect of caufes, denotes an
order of causes, wherein several of the fame kind, order,
and tendency, concur to the production of the fame
effect.

COORNHAERT, or CURNHEART, in Biography. See
Theodore Dirc.

COORROORAA, in Geography, one of the Pecow isles,
the capital of which is called Pecow; which see.

COOS, in Ancient Geography, an isle of the Egean or
Icarian sea, near Cnidus (now called Zia); in which was
a city of the fame name, from which Hippocrates, the cele-
bro-
brated physicians, and Apelles, the famous painter, were
called gods. Here was a large temple of Asclepius, and
another of Juno. It abounded in rich wines, and here were
made those "Coos vinae," which were transparent, and are
so often mentioned by the ancient poets.

Coos, or Cooshes, in Geography, a country of America,
called Upper and Lower Coos, which lies on the Connect-
ticut river, between 20 and 40 miles above Dartmouth col-
lege. Upper Coos is the country S. of Upper Amooneuck
river on John and the Coos river. Lower Coos lies below
the town of Haverhill, S. of the lower Amooneuck. The
distance from Upper Coos to the tide in Kenn-bach river was
measured in 1793, and found to be but 90 miles.

Coos-Bayzar. See Coos-Bahzur.

COOSA, or Coosa-Hatchee, a river which rises in the
high lands of the Cherokee's country, and joining Tallas-
see, forms Alabama river. Its course is generally S.
through the country of the Natchez, and other tribes of the
Upper Creeks. It is rapid, and full of rocks and shoals, so
that it is hardly navigable by canoes.

COOSADES, an Indian town on Alabama river, in
America, about 60 miles above its mouth, on Mobile river;
below McGillivray's town, and opposite the mouth of the
Oakfilleke.

COOSA-HATCHEE, or Coosa, a river of America,
in S. Carolina, which rises in Orangeburg district,
and after running in a S.S.W. course, discharges itself into
Broad river and Whale branch, which separate Beaufort
island from the main land.

COOSAWATCHIE, or Coosahatchie, a post town
of America, in the state of S. Carolina, and district of
Beaufort, situated on the S.W. side of Coosa river, over
which a bridge has been erected. The place is flourishing,
having about 40 houses, a court-house, and a gaol. The
courts formerly held at Beaufort are held here. It is 33
miles distant from Beaufort, and 77 W.S.W. from Charlec-
ton.

COOSCOOSOO, a common food among the Moors
of Africa, consisting of a paste made of flour in the form
of small grains in the manner of Italian pasties. This is drest
by the vapour of broth in a round dish, with holes like a
collander, and that is fixed in the kettle in which they boil
their meat. The cooscoosoo, contained in the deep plate or
collander, is slowly softened, and prepared by the vapour of
the broth, with which they take care to moisten it occa-
Sionally. This is a nourishing and agreeable food, and eaten
by the common people either with milk or with butter, but
superior persons have it drest by a rich broth made with
mutton, poultry, and pigeons or hedges-hogs, and mix it af-
afters with fresh butter.

COOSY, Coosa, or Ross, a river of Asia, which rises in
the mountains of Thibet, takes its course through Purnesh,
and runs into the Ganges, 20 miles E. of Boghpopour in
the country of Bahar.

COOT, in Ornithology. See Fulica atra.

COOTE, Sir Charles, in Biography, a distinguished
military officer in the 17th century, was the eldest son of sir
Charles Coote, who was created baronet in April 1621. He
was a gentleman of great consideration in Ireland. Upon
the breaking out of the rebellion, in 1641, he had a commis-
sion for a regiment of foot, and was made governor of Dub-
lin. From this period, to the year 1653, he was engaged in
a great number of important services for his country. In
almost all the contests of which he took a part he was suc-
cessful. After Ireland was reduced to the obedience of the
parliament, sir Charles was one of the court of judicature in
the province of Connaught, of which he was made president by
act of parliament. Being in England at the time of the de-
posing of Richard Cromwell, he went post to Ireland, to
carry the news to his brother Henry Cromwell, and to concer-
with him what to do in order to maintain themselves in their
posts. When, however, he perceived that king Charles the
Second's interest was likely to prevail, he endeavoured to in-
nuinate himself into his favour. For this purpose he sent to
the king a letter: "to assure his majesty of sir Charles's affec-
tion and duty, and that if his majesty would vouchsafe to come to Ireland, he was confident the whole kingdom would declare for him; that though the present power in England had removed all the labor men from the government of the state in Ireland, under the character of presbyterians; and had put Ludlow, Corbet, and others of the king's judges in their places, yet they were generally so odious to the army as well as to the people, that they could feize on their personas, and the ca-
tle of Dublin when they should judge it convenient." The
king did not think it prudent to accept the invitation. In
a short time after sir Charles Coote, and some others, so in-
fluenced the whole council of officers, that they prevailed
upon them to vote not to receive colonel Ludlow as com-
mander in chief; they, moreover, made themselves masters
of Athlone, Drogheda, Limerick, Dublin, and other im-
portant places for the service of the king. He immediately
caused colonel Monk to be made acquainted with the pro-
gress of the king's interest in Ireland, who urged them by
every means not to restore the suspended commissioners to the
exercise of their authority. Soon after, sir Charles Coote
and others sent to the parliament a charge of high treason,
against colonel Ludlow, Corbet, Jones, and Thomlinson.
He likewise made himself master of Dublin-castle; and ap-
prehended John Coke, chief justice of Ireland, who had
been solicitor-general at the trial of king Charles I. Not-
withstanding this, parliament thought themselves too far
of him in their interpell that he received their vote of
thanks on the 5th of Jan. 1659—60. On the 14th of the
same month he was appointed one of the commissioners for
the management of the affairs of Ireland. Before those
commissioners declared for king Charles, they infilled upon
certain things relating to their interell as members of that
nation. On the 6th of September 1663, sir Charles Coote,
on account of his many and very valuable services for the
royal cause, was created baron and viscount Coote, and
earl of Montrath in the queen's county. He was also ap-
pointed one of the lords justices of Ireland, but he did not
long enjoy those marks of his sovereign's favour, for he
died in December 1661, and was succeeded in his estate
and titles by his son Charles, the second earl. Dr. Le-
lond affirms that Coote and his father had engaged in the
parliamentary service not from principle, but interest. Dr.
Kippis, however, doubts the assertion upon the ground
that the Cootes were zealous Presbyterians, and therefore
he thinks it highly probable that they were influenced, at
least in part, by their real sentiments, civil and religious,
and especially by their aversion from popery.—Britan.

COOTE-HILL, in Geography, a market and poct town
in the county of Cavan, Ireland, near the borders of Monag-
han. It was much neglected by the late proprietor, but the
present one is improving its appearance by public buildings,
such as a market-house and shambles; and by obliging ten-
ants to build on a plan adopted by him. It contains
six houses of worship, besides the parish church. In the
sale of its markets it is the most considerable town in the
county. The sale of linen alone averages 4000L. weekly,
principally of sheetings, in which branch no market in Ire-
land.
land can vie with it. It is fifty-three Irish miles N.W. from Dublin, and ten miles N.E. from Cavan. Coote's survey of Cavan, &c.

COOTSTOWN, a town of America, in the state of Pennsylvania and county of Berks, is situated on a branch of Sauaboca creek, which is itself a branch of the Schuykill river. It contains forty houses, and a German Lutheran and Calvinist church. It is distant seventeen miles N.E. from Reading, and seventy-three miles N.W. by N. from Philadelphia.

COOTWYCK, or Kootwyck, Jurian, in Biography, a goldsmith, born at Amsterdam in 1774, who applied himself after the example of his countryman Pieter van Amstel, to the imitation of drawings by means of etching and aquatinta. Amongst his works, are several prints from the designs of Backhuysen, Berghem, and other Dutch and Flemish masters; and likewise some, which is supposed he executed from sketches of his own. One of his prints in imitation of black and white chalk, representing an old woman sitting in a chair, with a paper in her hand, is dated 1749. Heineken.

COP, William, born at Bale in Switzerland, took his degree of doctor in medicine at Paris, in the year 1495, and soon became so distinguished by his superior knowledge and abilities, that Ramus, no incompetent judge, called him "Unica nobilium medicorum gloria." He was physician to Lewis the twelfth, and to Francis the first, and ancient to the Faculty of Medicine at Paris. He translated the work of Paulus of Aegina, de Ratione Medicinae, which was published at Paris in the year 1510, in 4to; and the following year at Strasbourg; also, Galen's six books, de Locis Affectis, et de Morborum Causis et Differentiis, and the Prognostics of Hippocrates. He died in 1531. His son Nicholas succeeded him as regent of the University of Paris, but giving into the errors, his biographer says, of Calvinism, he was obliged to leave Paris, and to pass the latter part of his life at Bale. Haller Bib. Med. Eloc. Dict. Hist.

COPE, in Ancient Geography, a town of Greece, in Bocota, situated on the north banks of the lake Copais, to which it gave name. It is mentioned by Strabo, Ptolemy, and Pliny; the latter of whom says, that cars were invented in this place. It had temples of Ceres, Bacchus, and Serapis.

COPAIASA Balsam, in the Materia Medica. See Balsam.


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drying linseed, or other fixed oil. These are used sometimes separately with the varnishes, but generally mixed.

We shall give some of the processes by which copal may be dissolved in each of these substances.

Alcohol finely, which so readily dissolves the other resins, has but little action on copal; for if this resin in fine powder be digested with the very purest alcohol, with or without heat, scarcely any of it is dissolved, and the copal coagulates at the bottom of the vessel into a tough coagulated mass.

But a solution may be effected by the addition of camphor, the action of which, upon the resin, has been partially described under the article. With some it is more striking than with copal. When the two are separately powdered and mixed, the copal absorbs the camphor, swells, and softens into a pulpy mass, which will remain for months of the same consistence, without hardening. To make an alcoholic solution of copal, dissolve half an ounce of coparner in a pint of highly rectified alcohol; put it in a glass vessel over a lamp, and add four ounces of copal in small pieces, and continue the heat just to that degree at which the bubbles may be counted, till the solution is complete. Part of the copal separates when cold, but most of it remains in permanent solution.

It is necessary first to dissolve the camphor in the alcohol; for, if the pulp mass arising from the mixture of copal and camphor be added to alcohol, the solution will not go on.

A mixture of mallic, elemi, and other resins, will bear a moderate quantity of copal, without being rendered insoluble in alcohol, even without the assistance of camphor.

To dissolve copal in the essential oils, Mr. Sheldrake has given the following process in the Transactions of the Society of Arts.

Reduce two ounces of copal to coarse powder; put it into a glass vessel, and pour thereon a pint of the very best oil of turpentine, with one eighth of spirit of ammonia, previously well shaken. Cork the glass, leaving a pin-hole through the cork to allow of the escape of vapour, and speedily heat it to that point at which the bubbles may be counted. Continue this till the solution is complete, taking care not to increase the heat, otherwise the copal will coagulate at the bottom of the glass, and the solution will not go on. The vessel should not be opened till quite cold. This liquor is of a rich deep yellow when in quantity, but when applied as a varnish, it is nearly colourless. The spirit of ammonia is not a necessary ingredient.

Mr. Tingry of Geneva (Painter's and Varnisher's Guide, 1804) finds that copal may be united to oil of turpentine by the intermedio of some other of the essential oils, particularly oil of spike and lavender. He gives the following process: Take two ounces of oil of lavender, heat it in a glass matras, add thereto an ounce of copal ground powdered, and, at different times, stirring the mixture with a flack of white wood. When the copal is dissolved, add six ounces of oil of turpentine, nearly boiling, and stir the whole thoroughly. This gives a fine gold-coloured liquid, very fit for varnishing.

Camphor also highly assists the solution of copal, in oil of turpentine, as it does in alcohol, and the same precaution is necessary, of dissolving the camphor completely in the oil, before the copal is added. Half an ounce of camphor is sufficient to a quart of the oil, to enable it to take up as much copal as will make a good varnish.

To unite any of the resins with drying linseed oil in the composition of the oil varnishes, it is necessary to expose them to a much greater heat than in the former instances, that is, not less than is sufficient to liquefy the resins. This, however, always gives the resin a certain degree of brown colour, which is often injurious to it when used as a varnish. Copal when melted with as little heat as possible, and then dropped into drying linseed oil, dissolves therein with ease, and this solution mixed with clear turpentine, forms a very fine hard varnish. To avoid as much as possible the discoloration of the copal, Mr. Tingry incloses it in a very slow-well-regulated furnace; and, as soon as any portion melts, it falls in drops into the drying oil heated and set beneath it.

When copal is dropped into water, a small quantity of oil is separated, and floats at top, and the resin at the bottom is thereby rendered somewhat more soluble in the different mercuric.

Copal is liable to be confused with gum ammonium, when the latter is very clear and good. The distinction is of some consequence, as the former, though valuable in varnishing, is much less so than the finest copal, the varnish with the former being darker coloured, and not so hard. Besides the external appearance of each, which is pretty distinct to a practised eye, the solubility in alcohol furnishes an useful tell, the former being readily soluble in this fluid, but the copal scarcely so.

COPALLI, in Botany, Hermard. See Rhus copalina.

COPAR, in Ancient Geography, a village of Arabia Felix, according to Ptolemy,—Alh, a place of Palestine, in the vicinity of Cesaarea Philippi.

COPARCENERS, from coparceny, and party, or a copartner.

COPARCENERS, from co- and participes, partner; or parners; such as have equal portions in the inheritance of their ancestor.

Coparceners are so either by law, or custom. Coparceners by common law, are the issue female; which, in default of a male heir, come equally to the lands of their ancestor; thus, when a person feited in fee-femipie or in fee-tail dies, and his next heirs are two or more females, his daughters, sisters, aunts, cousins, or their representatives; in this case they shall all inherit, and the co-heirs are then called coparceners or parners.

Coparceners by custom, are those who, by some peculiar custom of the country, challenge equal parts in such lands; as in Kent, by the custom of gavelkind, according to which lands descend to all the males in equal degree, as sons, brothers, uncles, &c. In either of these cases, all the parners put together make but one heir, and have but one Heller among them. Co. Litt. § 241, 242, 265; and 163. The crown of England is not subject to coparcenary.

COPARTNERSHIP. See PARTNERSHIP.

COPAS, in Ancient Geography, a river of Asia Minor, in Caria.

COPATZ, in Geography, a town in the island of Cherofo; 8 miles N. of Cherofo.

COPE, an ecclesiastical ornament, usually worn by chanters and sub-chanters, when they officiate in the church-service. It is also worn by the Roman bishops, and other ordinaries; it reaches from the shoulders to the feet. The ancient called it phialon.

In the trial of archbishop Laud, one of the charges alleged against him was his introducing the use of copes and church music into divine worship. To this charge he re-
plied, that the use of cope is prescribed by the 24th canon of 1603, which says, "that in all cathedrals and collegiate churches, the communion shall be administered on principal fast-days, sometymes by the bishop, if precent, sometymes by the dean, and sometymes by the canon or prebendary, the principal minifter using a decent cope;" so that in this respect he had made no innovation.

To this defence it was replied, that neither the common-prayer book, nor book of ordination, nor homilies confirmed by parliament, nor queen Elizabeth's injunctions in her first year, make any mention of cope, though they are evidently derived from the popish wardrobe; and the last common-prayer book of king Edward VI. expressly prohibits them. The 24th canon of 1603 enjoins only the chief minifter to wear a cope at the administration of the sacrament, whereas the archbishop preferred them to be worn by others besides the chief minister, and as well when the sacrament was not administered as when it was. But these canons not being confirmed in parliament, expired with king James, and therefore could be no warrant for their present use.

Cope, in Biography, a Flemish sculptor of the 16th century, who resided at Rome, and is celebrated by Baglione for the beautiful baso-relievo which he modelled, in a small fixe, from the Fables of Ovid; and which were afterwards cast in gold and silver, for the purpose of ornamenting the magnificent furniture of those times. The above-mentioned author informs us, that impressions from these beautiful models were generally dispersed and much admired at Rome. From Baglione's description of these works, we might be led to conjecture, that many of these small baso-relievo in bronze, which are usually attributed to Benvenuto Cellini, are of no other than casts from these models of Cope. I lie said to have succeeded in some small productions in ivory; and, ultimately, to have attempted a statue of a larger size in marble, which, however, after a long and fruitless labour, he left unfinished. He was not less remarkable for his talents, than for his morose and unofficious disposition, and he died miserably at about the age of 60. in the pontificate of Paul V. Baglione.

Cope, St. Martin's, was a relique formerly in great esteem among the French kings; and was often carried with them to war, as a protection and a weapon.

Cope, among miners, is a custom or tribute due to the king, or lord of the soil, out of the lead mines in some part of Derbyshire. This duty amounted, according to Manlove, to sixpence a load, nine dimes making one load.

COPE, in Commerce, a Muscovite coin, valued at about a half-penny; so that 100 cope is equal to a ruble, which is valued at an average at 4s.

COPE-STAKE, a German coin, valued at 12d. Perling.

COPENHAGEN (in Latin Hafnien, in Danish Kjoben- havn), originally Kjodenschavon, the Merchants' harbour, in Geography, is the capital of the kingdom of Denmark, situated on the eastern shore of the island of Zealand, in a bay of the Baltic sea, about 23 English miles from the Sound. E. long. 12° 35'. N. lat. 55° 41'. 160 miles W. of Hamburgh, and 240 S.W. of Stockholm. Its circumference is from 4 to 5 English miles.

In the 11th century Copenhagen was only a mean fishing place. It owed its increase to a cable, which protected its inhabitants against the numerous pirates who infested the Baltic sea. Leve, or Lettura, of which some remains have been found near Roschilb, had been the residence of the Danish kings till the year 950, when that distinction was bestowed on Roschilb itself, from whence the seat of empire was transferred to Copenhagen, in 1443, during the reign of Christophel of Bavaria. From that time the kings of Denmark have continually resided at Copenhagen.

This city was always well fortified by nature and art, but the strong citadel of Frederickshavn, between the harbour and the great gate, was only erected in 1663, previous to which time Copenhagen had often been attacked. In the year 1523 it was besieged by Fredericke, duke of Guttorp, supported by a fleet from Lubeck, consisting of ten ships of war. Tossed by famine, and cut off from all hopes of relief, the citizens surrendered, after a close siege of seven months. Thirteen years after, when, on the death of Fredericke, the inhabitants attempted to replace their old and favourite king Christiiii I. on the throne, Copenhagen underwent the same fate.

In 1568, Charles Gustavus, king of Sweden, having led his army over the ice, overran Denmark, and in the month of August appeared before Copenhagen, whilst his fleet blockaded the harbour. Bombs and red-hot balls were thrown into the city, but the fire was being nstinctly extinguished by the activity of the inhabitants. However, in the month of October of the same year the Dutch fleet, under the command of admiral Opdam, came to the assistance of the besieged, defeated the Swedish fleet, and threw a large supply of provisions into the town. Charles Gustavus at length ventured a general assault in the night between the 11th and 12th of February 1659, when the ditches about the ramparts were thickly frozen. The chief attack was directed against the western rampart which the citizens and students defended with such obstinacy, that the Swedish monarch, giving up all hopes of taking the city, retired, and the year following concluded a peace. As a reward for their bravery, the citizens and students obtained privileges which they enjoy at this day.

During the reign of Frederick II. in the year 1700, Copenhagen was again besieged on the land side by a Swedish army under the command of the renowned Charles XII. and on the sea side by the combined fleets of Holland, England, and Sweden. The Danish king was in Hamburgh, but the queen dowager, Charlotte Amalia, having animated the city and students to a brave resistance, neither the numerous Swedish army, nor the combined fleets, could make any impression on the town. The peace of Travendahl put an end to the frige, and Copenhagen enjoyed a complete century of uninterrupted peace.

On the 23d of April, 1801, the English vice-admiral, Nelson, with 11 ships of the line, 7 frigates, and 10 small vessels, attacked the line of defence before the port of Copenhagen, and, after a most obstinate engagement of three hours and a half, unfurled the white flag, took possession of 11 Danish ships, and, by an equally well-timed and skilful negotiation, detached Denmark from the maritime league into which she had entered with Russia and Sweden against England. The harmony between the two countries was restored, but continued only until the month of August 1807, when a strong English fleet encircled the island of Zealand, having previously disembarked an army of nearly 20,000 men, under the command of lord Cathcart, which invested Copenhagen by land. After a vigorous bombardment of five days and nights, during which Copenhagen made a defence worthy of the acknowledged bravery of the Danes, and the citizens and students displayed the most undaunted courage, a capitulation was agreed upon on the 7th of September, by which the English troops were allowed to take possession of the citadel for six weeks, and the whole Danish army, consisting of 18 sail of the line, 15 frigates, 6 sloops.
and 25 gun-boats, together with all the shores of the naval arsenal of Christian IV, were surrendered to the disposal of the king of Great Britain.

On this occasion Copenhagen suffered severely. In the night of the 4th of September the grand fleaie of St. Mary's, or our lady's church, which was 380 feet high, and stood on the highest spot in the city, was set on fire, and after having blazed for four hours, fell with a most tremendous crash. From six to seven hundred buildings, besides those of the university and one hospital, were burnt to the ground; thousands were damaged, and no more than four hundred houses escaped unhurt. Several valuable libraries fell a prey to the flames, and five or six hundred peaceable inhabitants were killed or maimed.

Anciently, Copenhagen had often been visited by the plague. The last which raged, in 1711, swept away great numbers of the inhabitants. In more recent times, Copenhagen has been frequently exposed to terrible conflagrations. On the evening of the 20th of October 1728, a fire broke out in a low house, not far from the well-gate, which spread with such fury, that at eight and forty hours the most elegant part of the city was laid in ashes; 1050 dwelling houses, four churches, the university buildings, and several other public edifices were burnt down to the ground. On the 26th of February 1794, the church of St. Nicholas, and the royal palace of Christianborg, the gorgeous magnificence of which is sufficiently attested by its stupendous remains, were destroyed by fire, and hardly had the private houses, which suffered in this dreadful calamity, been rebuilt, when another considerable part of the city was reduced to ashes in 1795.

These conflagrations contributed, however, to render Copenhagen one of the finest cities in the north. The houses, though mostly of brick varnished, exhibit a beautiful and uniform appearance, the streets are furnished with lamps; well paved, with a foot way on each side, and running in a straight line; but some of the streets are rather too narrow.

Copenhagen is divided into the Old and New Town and Christianhafen. The Kongens nye Torge, or king's new Market, which connects the Old with the New Town, is a spacious, irregular area, embellished with an equestrian statue in bronze of Christian V., and adorned with several handsome buildings, among which are the palace of Charlottenburg, devoted in part to the Royal Academy of painting, architecture, and sculpture; and the theatre, which, though small, is neat and elegantly decorated within. In the New Town is a beautiful octagon, containing four uniform and elegant buildings, in two of which the royal family resided ever since the palace was burnt down. In the middle of the octagon stands an equestrian statue of Frederick V., in bronze.

Christianhafen is built on the island of Amack, and connected with the Old Town by two bridges. Besides the fine dock-yards, where the men of war are refitted, Christianhafen contains the great West India fuagar house and the East India house. The island of Amack itself is considered as the kitchen garden of Copenhagen, and furnishes the same with greens, fruit, milk, butter, and cheese in abundance. It is 9 miles long and about 2½ miles in breadth. It contains above 800 families or 4000 souls, and is divided into two parishes, Taarnby which is inhabited by Danes and Dutchmen, and Hollanderyke inhabited only by the descendants of a Dutch colony, which king Christian II. transplanted hither from North Holland, in 1516, at the request of his wife Elizabeth, sister to Charles V., who was a native of the Low Countries. The language of the inhabitants of Amack is still a mixture of Danish and Low Dutch. They have preferred their particular dress, manners, and customs. The men wear broad brimmed hats, black jackets, full glazed black breeches, loohe at the knee; the women black jackets, red petticoats, and a piece of blue glazed cloth bound round their heads. There is a particular market place at Copenhagen for the peafants of Amack, called the Amack market.

The harbour of Copenhagen, formed by the braits of Kelleboe, between the islands of Zealand and Amack, is capable of holding 500 ships. It is protected by several batteries, of which that of the three crowns is the most formidable. The naval arsenal, called Chriilliamholm, is much superior to that of Venice. The forges, workshops, rope-windows, are upon an admirable construction. Each ship has her separate magazine, containing all the materials for her equipment. The men are registered and divided into two classes; those who in time of peace are permitted to serve on board the merchants' ships, or to enter into foreign service, subject to be recalled in case of war, and the stationery sailors who are always in the employ of the crown. The latter, 4000 in number, live in barracks at Copenhagen. The academy of marine cadets forms one of the palaces in the octagon of the New Town. It was founded in 1701, for the education of fifty young gentlemen, who are boarded and instructed gratis; but more are admitted, on paying, to share in their instruction. They have to pass through several severe examinations before they are entered as midshipmen in the king's ships.

Copenhagen is the chief commercial town of all Denmark. Its principal domestic trade is with Norway, Iceland, the Faro islands, and Greenland. Since the year 1754, the trade to the West Indies is free to all the Danith ports; yet Copenhagen receives, almost exclusively, the return cargoes from St. Croix, St. Thomas, and St. John. Copenhagen is also the seat of an East India Company, a Jiro Bank, an Insurance Company; and its extensive foreign trade is chiefly with Germany, the countries round the Baltic, and the Mediterranean seas, France, Portugal, and Spain. In the year 1792, Copenhagen had only 218 ships of about 24,000 tons, but during the long wars between France and England their number has been nearly doubled.

The most important manufactures of Copenhagen are the woolen cloth and flax, the calico-printing, silk, and China manufacture. The latter, though in its infancy, is thought to rival those of Dresden and Berlin.

Copenhagen is the seat of an university founded in 1575. It is richly endowed, grants a support of 1 marks Danith, or nearly 3 shillings English, a week to 180 poor students, and since the year 1791 distributes eight premiums annually for the best answer to eight prize questions. There are four colleges, in which 166 students are provided with lodging, fire wood, and pecuniary stipends. The number of students is generally between five and six hundred.

Since the year 1742, several learned associations have been formed at Copenhagen, the oldest and most known of which is the Royal Society, whose researces have thrown great light on northern history. This society superintends all the geographical mentation of the country, and the publication of new special maps. It proposes four quillions annually, and the 'priam for each is a gold medal worth twenty pounds sterling. But besides the Medical Society, founded in 1772, that of Icelandic literature, founded in 1779.
1779, and that of natural history, founded in 1789, the most important is the Royal Economical Society, founded in 1768, whose annual income of 6000 dollars, or 1200l. Sterling, is expended in promoting the fine arts, fisheries, agriculture, and horticulture, and in encouraging every attempt that tends to benefit the country. It is now endeavoring to establish a regular importation of coals from the Faro islands. There is also a board of longitude and a repository for marine charts, founded in 1784, which has published excellent charts of the entrance of the Sound, of the two Belts, the Sound and the Baltic as far as Barnholm, of the Cattegat, of part of the western coast of Iceland, of part of the eastern coast of Iceland, of the Faro islands, and six charts of the coast of Norway. Copenhagen has likewise acquired some celebrity from its royal museum or cabinet of curiosities remarkable for Laplandish dress, implements, and arms; from its excellent theatre of anatomy, founded in 1736, and from its public royal library, which, in 1797, was increased with the celebrated Suhm’s library of 50,000 volumes, collected by himself, and relating chiefly to the antiquities of northern Europe.

There is only one theatre at Copenhagen, which is partly supported by the court. During the year 1806, it brought out nine translated pieces, and only one original Danish comedy. The performances of the seafow amounted to 158. There has been no Italian opera of late; only occasionally, and for a short time, German and French plays are performed by itinerant companies.

Copenhagen is the seat of a supreme tribunal, which is the highest court of justice for all the Danish dominions. Its fittings are opened with great solemnity in the beginning of March, on the ancient Herredag or Dannebøe (meeting of parliament) by the king himself. And besides the inferior courts of justice there are boards of conciliation, or what are called conciliatory committees, whose duty it is to accommodate matters between the parties by all possible means of persuasion. If an accommodation takes place, the expenses are very trifling, and the parties are bound to abide by it. From the 13th of August, 1795, when the first conciliatory committee was established at Copenhagen till the 31st of December 1801, 13,223 litigations were prevented at Copenhagen only in the course of six years and a half.

The bishop of Zealand, who is first in rank among the twelve bishops, of whom the Danish hierarchy is composed, resides at Copenhagen, which, besides the cathedral, counts 20 churches, one French protestant church, and several chapels for the Jews, whose number amounts to 1200. They are most liberally treated at Copenhagen, and there is even a society established by Christians for the purpose of encouraging the instruction of Jews in arts and handicrafts.

In the year 1714, Frederick IV. established at Copenhagen a board of millions or Collegium de Curia evangelii promovenda, which sends missionaries to Greenland, and to the East Indies. The letter are also supported in part by contributions collected at London. In the beginning of 1807, Copenhagen, with its suburbs, counted 3156 houses, and 124,000 inhabitants. The regulars for the year 1806, gave 3440 born, 3109 dead, and 930 couples married. In 1799, Copenhagen counted only 82,608 inhabitants, one-sixteenth, or 5168, of whom were paupers. Yet no beggars are seen in the streets. A board of almshouses over the poor, who are provided for by voluntary contributions. Copenhagen has twenty-two hospitals, and thirty poor-houses. In 1802, the principal infirmary admitted 2349 patients, 1813 of whom were cured, 218 died, and 318 remained in the house. The naval hospital, or Næstved house, contains 300 invalids.

The police at Copenhagen is vigilant and good. A paper published weekly, under the title of the Friend of the Police, has particularly contributed to render the police excellent, by pointing out the most minute objects with regard to which it was thought deficient. Since the year 1804, the prisons have been rendered much more comfortable. They are all wainscotted and boarded, provided with bedsteads, blankets, and mattresses; and no person, whatever may be his crime, is ever confined in a dungeon or cell. In the Raab-house, where capital offenders are shut up for life, the male convicts rap and saw Brazil wood, the females spin, and thus they all contribute towards their support by their labour. There is also a board of health, and a committee for promoting vaccination, under whose superintendence 6489 individuals were inoculated for the cow-pox at Copenhagen, in the course of the year 1802.

Copenhagen is surrounded with country seats, which offer the most enchanting sea-scenes. Its environs are beautiful, the country being finely varied with small forests of beech and oak. Of the summer-palaces in its neighbourhood, Fredericsholm is the most remarkable for its delightful situation.

Without the western gate, close to Copenhagen on the high road, stands an interesting monument in commemoration of the emancipation of the peasants, which was effected under the present king. Four figures of white marble, representing peace, plenty, content, and industry, occupy the four corners of a pedestal, from the centre of which rises a pyramid. On one side of the base are these words: “For Christian den syvende de Danikkes og Norges Konge, af Wihime og taknemmelige Borgere.” To Christian the Seventh king of the Danes and Norwegians from united and grateful citizens; and on the other, “Grund flæske blev hæst af Frederik kongens son, folkerne varet 1792.” The foundation stone was laid by Frederic the king’s son, the friend of the people.


COPPERARIO, Giovanni, or John Cooper, in Biography, an English musician, who, having resided for some time in Italy, on returning to his native country, Italianized his name, and became a favourite performer on the lute and viol du gambe, and a voluminous composer of fantasias, fantasias, for viols, in three, four, five and six parts. He was appointed music-maister to the children of James I.; and Prince Charles, under his influence, made a considerable progress on the viol. Some of his vocal compositions were printed in the musical publications of the times. In conjunction with Nicholas Laniere, and others, he composed the fongs in a Masque, written by Sir Thomas Campion, on the marriage of Carr, earl of Somerset, and lady Frances Howard, the divorced countess of Exford, which was performed in the Banqueting Room at Whitehall, on St. Stephen’s night, in the year 1604. Mr. Fenton, in his notes on Walter, says, that Henry Lawes, having been educated under him (Copperario), “introduced a better mixture of Italian airs than had before been practised in this country;” from which, and from his giving him the title of Signor, he seems to intimate, that he regarded him as an Italian. The following are the titles of his printed works, exclusive of the songs which he composed in conjunction with
with Lanier: "Funeral Tears for the Death of the Right Hon. the Earl of Devonshire, figured in feaven Songs, whereof fixe are so fet forth that the Words may be expressed by a treble Voyce alone to the Lute, and base Viol, or else that the mean part may be added, if any shall effect more fulfemle of parts. "The fanventh is made in forme of a Dialoge, and cannot be sung without two Voyces. Invented by John Coperario." Fol. London, 1606. 2.

"Songs of Mourning, bewailing the untimely death of Prince Henry, worded by Thomas Campion, and fet forth to bee sung with one Uoce to the Lute or Viol, by John Coperario." Fol. Lond. 1613.

**COPERNICAN SPHERE.** See SPHERE.

**COPERNICAN SYSTEM.** is that system of the world, wherein the sun is supposd at ref in the centre; and the planets, with the earth, to move in ellipses round him.

The heavens and stars are here supposd at ref; and that diurnal motion which they appear to have from eft to zef, is imputed to the earth's motion from zef to eft.

This system was afferted by many of the ancients: and particularly Ephraem, Seleucus, Aridarcus, Philolans, Ceanthes Samius, Nicetas, Heraclides Ponticus, Plato, and Pythagoras; from the last of whom it was anciently denominated the Pythagoric system.

It was also held by Archimedes, in his book De Grando in Aeternum Arnum Numero; but after him it became negleced, and even forgotten, for many ages; till above three hundred years ago, when Copernicus revived it; from whom it took the new name of the *Coperican System*. See COPERNICUS.

**COPERNICUS, NICHOLAS, or rather COPERNICK, in Biography, the celebrated astronomer, was born at Thorn in Prudia, near the Old Gate, on the 19th of February, 1473; in a house which was firft extant in 1579, and loan to strangers as one of the greatest curiosities of that town. His father was a gomme; his mother's brother, Lucas Walperebrd, or, as he is fometimes called, Haff-brodt Von Allen, was, fome years after young Copernicus's birth, raised to the dignity of bishop of Ermeland, in Latin, Episcopus Vurmienfis: which circumfances has betrayed molt of the English biographers into a fingular mistake. They make Copernicus cano of Worms, in the fouth of Germany, instead of Frauenburg in Prudia, which is the fce of the bishops of Ermeland.

Copernicus received his firft inftructions in the grammar school of his native city, from whence he was fent to fudy phyfics at the university of Cracow, where he gained the academical honour of a doctor's diploma. But he never practifed as a physician, though he readily gave his advice, and his medicines, without any fee, to thofe friends who confulted him. Mathematics were his favourite study: and he took particular delight in the study of perspective; and this induced him to acquire the art of painting, in which he is faid to have excelled. From the infant he had heard Albert Brufzevus's mathematical lectures at Cracow, he was fired with the noble ardour of emulating the two greatest mathematicians of his time, George Purbach, an Auffrian, and John Regiomontanus, a native of Könifberg, in the Neumark of Brandenburg. To accomplish this arduous defign, he went to Italy, and was at firft the pupil, but foon became the friend and afliliate, of Dominicus Maria, of Ferrara, who was then teaching mathematics at Bologna, and whofe hypothefes about the variability of the axis of the globe, by exciting universal attention, gave Copernicus the first ideas of the motion of the earth. At Bologna, in the year 1476, Copernicus firft observed the ocultation of Pali-rium by the moon.

He left Bologna to teach mathematics at Rome, where he obferved an eclipse of the moon in the year 1500; and such was his dawning celebrity, that, even after his return to Prudia, he was confuted by the clergy of Rome, in the year 1516, respecting the improvement of the calendar. In the mean time his uncle, the bishop of Ermland, had made him a canon of the chapter of Frauenburg; and the town of Thon had named him to the archdeacony of the church of St. John; yet he seldom lived in his native city, but made Frauenburg his principal refidence. Zealously attached to the tenets of his church, he fulfilled the duties of his clerical offices with punctual care. The glorious Reformation, which he witnessed, had no influence on his religious opinions: his mind pursued a different trage. Drawing and painting, the study of perspective, and the making of mathematical instruments, filled his leisure hours; and besides his regular avocations, the conftitution of some aquaducts absorbed his time. "That which feeds the mill of Grandaunz with water has been completely preferred; of another, which supplied the hill of Frauenburg, on which the canons reside, nothing remains but the tower on the banks of the Pfaffage, to the top of which he raised the waters of that river, and which exhibits the following inscription:

"His patimurr aqifum properar propas tocsie, Ne carent fraters Incola montis opa."

Quod natura negat tribuit Copernicus arte, Unum pro culcis Fanis loquitur opus."

Whenever the bishop was absent, Copernicus was entrusted with the government of the diocefe; and after the death of two prelates, he was appointed general vicar during the vacancy. He was also frequently deputed to the provincial diets. Nothing, however, could divert him from his original purpose. He applied his stores of mathematical knowledge to the improvement of astronomy. The garret of his house at Frauenburg, which is still shown, and the iceplool of the cathedral, were his observatories. The epicycles and eccentrics of Ptolemy embarrased and perplexed him; but the hypothesis of the earth being the motionless centre of the universe, was generally received; it had been adopted by Plato and Aridarcus, whose authority was confidered paramount to that of the bible; and Justin's command to the fun and moon confirmed it. To attack this systenl was incurring the imputation of heresy; and it required no extraordinary courage to advance an opinion, for which Galileo suffered a century after.

In this perplexity, Copernicus afiduously searched the lore of antiquity. He found that the Egyptians taught the revolution of Mercury and Venus about the sun; that Apollonius and Pergaus had assigned the fame motion to Mars, Jupiter, and Saturn; that, according to his disciples, Nico-tas and Heraclides, Pythagoras, whose learning was derived from the Egyptians, afferted the earth's motion round its own axis; and that Aridarcus and Philolans went still farther, and maintained that the earth did not only move about its axis, but employed twelve months in revolvin the fun.

On these foundations Copernicus raifed a structure, of which his intense and acute fudy furnished him with the mot correct mathematical evidence. According to his fystem, the fun occupies the centre of the universe; the planets, in their proper fize, occupy all the fpace of the earth, and their motion round them, like epicycle, cece the earths fize; Mercury moves round the sun within three months, Venus within eight, the earth within twelve, and within four-and-twenty hours it revolves round its own axis; the moon is a satellite of the earth, about which the turn

thirteen
thirteen times in a year; Mars takes two, Jupiter almost twelve, and Saturn nearly thirty, years to move about the sun.

It was in the year 1530 that Copernicus laid the first hand to his system, which he had begun to form about the year 1507; but he had not yet ventured to launch it into the learned world, when its fame reached the bishop of Capua, cardinal Nicholas Schönberg, who, in 1534, by a letter which does honour to his sentiments, invited Copernicus to publish his new system. Other great men, particularly Timo- deman Gicle, bishop of Culm, assisted him with their in- treaties to the same purpose. But his model was still re- fining their proficiency, when Rheticus, professor of mathematics at Wittenberg, excited by an ardent thirst of learning, resigned his chair, and visited Copernicus at Frau- enburg, in the year 1539. To him Copernicus at last trusted his work, which, in 1543, was printed at Marien- burg, at the expense of cardinal Schönberg, under the title of “Nicolaï Copernici de Revolutionibus Orbium Coelestium, Libri vi.” But he did not live to read his book in print. A copy of it reached him only a few hours before his death, which happened at Frauenburg, on the 23d of May, 1543, three months and three days after he had entered the seventy-fifth year of his age. He was probably buried at the foot of the altar before which he used to celebrate mass; for, 38 years after his death, Cromeru, bishop of Ermeland, caused the following inscription to be placed on his tomb-flone, which is now shown in the chapter’s room:

D. O. M.
R. D. Nicolai Copernici Tomusenfis,
Artium et Medicinis Doctoris, Canonico Varminæni,
Prefalenti Astrologo et ejus Discipulis inauratorii,
Martinus Cromeru Episcopus Varminæn,
Honoris et ad Politaratem Memorize Caufa psuit,
MDLXXI.

Others pretend that Copernicus, having requested to be interred near his relations, was buried at Thorn, in the church of St. John, where he is represented in his canonical dréts, kneeling before a crucifix, and a globe on his fide, with this inscription:

“Non parem Pauli gratiam requiro,
Veniam Patri nique pofco, fed quam
In crucis ligno dedares Latroni, fedulos ore.”

Nicolai Copernici Thurmenciæ absolutæ subtilitatis math- ematico, ne tanti viri, apud epteros celebres, in sua patri periret memoria hoc monumentum psuit. Mort. Varminæ
ius fuo Canonicoatu, anno 1543, die 4, Ætatis LXIII.

This painting wrouth, in the year 1733, by a pupil of Thorn, named Rubinkowski. A print of it may be seen in Hartknoek’s Ancient and Modern Pruffia. It is supposed that Copernicus’s manuscripts were de- posed at Braunberg, in the Jefuits’ library, with the books of which they may have been removed to Sweden by Charles XI. Whether they be still extant in that country is uncertain. Ludwig von Backzo’s Klein Schriften, 1797, vol. ii. p. 135; Gaffendi Opera, vol. v. p. 499; Bernoulli’s Travels, vol. iii. p. 18. See the order and disposition of the heavenly bodies, as laid down by him, compared with those in the other systems, under the head SYSTEM.

This system has been established by new arguments ad- vanced by Kepler, Galileo, and Newton, in every succeeding age; and notwithstanding the opposition it met with, from the prejudices of men against the earth’s motion, the au-

thority of Aristotle in the schools, the threats of ignorant bigots, and the terror of the inquisition, it has generally prevailed. Galileo, after having demonstrated the motion of the earth, was obliged, by the rancour of the Jesuits, to go to Rome, and there solemnly renounce it. Besides which cruel treatment, he was condemned to a year’s imprisonment in the inquisition, and the penance of repeating daily some penitential psalms. As a specimen of the authority of the Romish church in opposition to this system, we shall only transcribe the declaration of the excellent commentator Le Scar and Jacquier, on the Perniciana, prefixed to the third volume. “Newtonus in lucu tertio libri

telluris motus hypothesim affuit. Autoris propositiones aliter explicari non poterant, sua enim quoque facta hypo-

theki. Hinc alienam coacta funnis generis perfomam. Cac-

turn latissimus summis pontificibus contra telluris motum decretis nos obsequi profiterur.”

COPERNICUS is the name of an astronomical instru-

ment, contrived by Mr. Whiston, for the calculation and exhibition of eclipses, and of the motions of the planets, both the primary and secondary ones, &c.

It was so called by the inventor, as being constructed on the Copernican system; or as representing the heavenly bodies agreeable to it. It consists of several concentrical circles of wood; upon which are inscribed numbers, transferred hither from the astronomical tables: by the various dispo-

sitions of these circles, which are made so as to slide within each other, questions are solved; and thus long calculations are saved, and the work of many hours brought into a few minutes.

For the exhibition of eclipses there is a peculiar appara-

tratus, consisting of a terrestrial globe, so disposed, as that, being turned round its axis, the light of the sun, or a candle, is projected through a glass plane, marked out into concentrical circles, expressing digits of the eclipse; and thus is the path of the eclipse, with its degree or quantity in any part of its path, agreeably and accurately re-

presented.

The instrument not being very common, a particular de-

scription would be superfluous. The author of it has writ-

ten a book to explain it.

COPTHANIA, in Ancient Geography, a port of Car-

mania.

COPTHANTUS, a mountain of Asia, placed by Pliny in Baetria.

COPHENES, a river of India, which ran between Alexandria, and the first scene of the military operations of Alexander, and which, as major Rennell conjectures, oc-

urred pretty early in his march. In Alexander’s arrange-

ment of boundaries, the river Cophenes was the eastern li-

mit of the province of Paropamisus, of which Alexandria was regarded as the capital; and that province, according to the ideas of Plutarch, lay between those which the mo-

derns name Korasan and Cabul. The major therefore con-

cludes, with some degree of confidence, that the river “Cw” of the Turkish geography, and the “Cow-mull” of Baber, which passes by Nughz, and whose principal branches are the rivers of Ghizini and Gardaiz, is the Cophenes; and that we must look for Alexandria in the quar-

ter of Bamian, though it is not possible to assign its particular situation. At all events, the proximity of Alexandria to the northern mountains, a fact which Arrian impresses

very strongly, renders it an impossible cafe, that Alexandria and Candahar can be one and the same place. Leaving Alexandria, at the foot of Caucasus, Alexander came to the river Cophenes, and passed it in the higher part of its course. From Cophenes, Hepleclusion and Perdiccas, with a strong
a strong detachment, were sent into the country of Punico- 
laotis (Arrian) or Punicolaitis (Strabo) near the Indus. 
Alexander marched from the banks of the Cophenes across the 
Alps, Tyre, and Arafai, nations, whose situations and mod- 
ern names are unknown, but supposed by Rennell to be 
inferior divisions of the modern Cabiul, and situated be- 
tween the rivers of Ghizmi and Cabul, at the height of 
Ijub and Dukkah. In his march to Arzauus, Alexander 
croft two rivers, the "Cheo" and "Eupfalia," and de- 
feating the Aipians in a pitched battle, near the latter, 
passed through the territories of the Guriel, and crofted 
the river of the fame name (see GURUS). The Cheo and 
Eupfalia may be two of the nine rivers of the Landharn. 
It is very difficult to determine the length of Alexander's march 
from the Cophenes to the Guriel; but it might possibly be 
100 road miles. As Alexander had crofted the Indus, proba- 
ably at Attock, when he came to the bridge (which was com- 
pleted before his arrival), he made an excursion by land into 
the country adjacent to the western bank of the Indus, in 
order to view the city of Nyfa (fuppofed by M. dAnville to 
be Nughz, or Nagaz, the Nagara, or Donyitized of 
Ptolomy); and he is then fuppofed to have entered the country, 
that lay between the two rivers, Cophenes and Indus. Ad- 
mitting that the Cophenes is the river that runs from Nughz, 
and falls into the Indus, 30 or 35 miles below the city of 
Attock, and as the river Cabul joins the Indus in front of 
the city of Attock, it is clear that, till he came opposite to 
that city, he could not be between the Cophenes and Indus. 
And if it be faid, that the Cabul river was the Cophenes, 
he had all along been between the Cophenes and Indus; 
and Arrian's words could have no meaning. Upon 
the whole we may conclude that the ancient Cophenes was the 
name with the modern Copoii, which fee. Rennell's Memoir, 
p. 175, &c.

COPHOS, a place of Greece, in Attica, situated before 
Pirae.

COPHOSIS, in Medical Writers, is used for defnefs, 
whether beginning, or perfect, or from what caufe fo- 
ever. 

The word is derived from νόσεως, I am defeaf.

COPHRANTA, or COPHANTA, an ancient town of 
Afia, in Carmania. Ptolomy.

COPHIS, Samuel, in Biography, a learned Jewish 
Rabbi of Spain in the eleventh century, was a native of 
Cordova, and published a commentary on the Pentateuch, 
the manufcript of which is ftil extant in the Vatican library. 
Thofe who have examined it commend it as an excellent 
work, except that it too much abounds with allegories.
The author died A.D. 1034.

COPHTH, COPHTHES, or COPTS, a name given to the 
Christians of Egypt; who are of the fect of Jacobites. 
They derive the latter appellation from the learned Jacob- 
bus Zainzalou, bishop of Edeffa, who, when the Coptes party 
had funk in number and credit, appeared in defence of the 
Monophysite doctrine; and by his writings, as well as inde- 
fatigable travels through moft parts of the East, fucceeded 
with fuch a degree in reviving and diffiminating it, that he 
hath been reverenced and efteemed by the whole ft, which, 
from respect to him have affumed the name of Jacobites: 
though the other Christians, as well as the Turks, call them 
by their old name Copts. By way of contempt fome have 
called them "Kuffu" or Girdlers, thus intimating that they 
are Christians only from the girdle upwards, but bear 
the fcare of Jewifh below it.
The critics are extremely divided about the origin and 
orthography of the word: fome write it COPHTH, others 
COPHTHE, COPHTHES, COPTS, &c. Scaliger derives the name

from COPHTH, an anciently celebrated town of Egypt, the 
metropolis of the Thebaid, whether they retired from the 
tyranny of the Greeks.

Kicher refutes this opinion, and 

maintains, that the word originally signifies cut and circum- 
scribed; and was given to one of the Mahometans, 
away of reproach, becaufe of their practice of circumcifion: 
but P. Sollier, another Jesuit, refutes this opinion. 
Scaliger afterwards fubfifted his opinion, and derived the 
word from ΑΥΓΕΤΗ, the ancient name of Egypt, by 
terminating the ft & italic: but this opinion, too, P. Sollier 
confiders.

Volney, concurring in opinion with Scaliger, obferves, 
that the Arabic term Kobi, a Copt, seems to be an 
evident abbreviation of the Greek word ΑΥΓΕΤΗ, an 
Egyptian; for the y was pronounced ou among the 
ancient Greeks; and the Arabs, having neither p nor g before 
a, o, u, always fubstitute for the letters b and j. 
John de Leo and others fay, that the Egyptians anciently 
called their country Edfbib, or Cibib, from Cibith their ft, 
whence Cophite, &c, others ftay from Cobim fcond ft of 
Egypt. Vanl. b derives the word Copfl from Copf, font 
of Mitrain, grandifion of Noah. All the etymologies P. 
Sollier rejects, on this principle, that were true, the 
Egyptians ought all equally to be called Cophites; whereas, 
in effe&, none but the Christians, and among thofe none but 
the Jacobites, bear the name; the Melchites not being 
comprehended under it. Hence he chooses to derive the 
word from the name Jacobites, by terminating the ft ylla- 
ble; whence Cophie, Cophia, Cops, and Copite.

Several families of thofe Copts are to be found in the 
Delta; but the greatest number inhabit the Said, where 
they in fome places occupy whole villages. Both his 
ftory and tradition attest their defcent from the people who 
were conquered by the Arabs, that is, from that mixture of 
Egyptians, Perfians, and, above all, Greeks, who, under the 
Ptolomies and the Conftantines were fo long in pofterifion of 
Egypt. Their name, according to the etymology given of 
it by Scaliger-and by Volney, fees to indicate that they are 
the remains of the ancient Egyptians; and this is the more 
probable, flince we find them in the Said before the time of 
Diocletian; and it is certain the Greeks were left numerous in 
the Said than in the Delta. This opinion of their origin is 
rather more probable, by confidering the diftinguifhing 
features of this race of people; and they are found 
to be all charafterized by a fort of yellowlefh dusky complexion, 
which is neither Grecian nor Arabian; they have all a 
puffed fignage, fwoman eyes, flat nofes, and thick lips, or, in 
short, the exact countenance of a Mulatto. Volney, when 
he faw the figure of the ipixus, and obferved its features to 
be precisely thofe of a negro, recorded the remarkable 
profile of Herodotus, in which he fays, (lib. ii.) "For my 
part, I believe the Colchi to be a colony of Egyptians, 
because, like them, they have black fkins and brizaded hair." 
Hence he concludes, that the ancient Egyptians were real 
noegos, of the fame fpecies with all the natives of Africa; 
and though, as we might naturally expect, after mixing for 
fo many ages with the Greeks and Romans. they have loft 
the intodity of their ft colour, yet they ftill retain 
strong marks of their original conforation. "And how 
are we astonifhed," fays Volney, "when we behold the pre- 
female and ignorance of the Copts, derived from 
the profound genius of the Egyptians, and the brilliant 
imagination of the Greeks; when we refpect that to the face 
of negroes, at preftent our slaves, and the objeds of our ex- 
reme contempt, we owe our arts, fcienccs, and even the 
very ufe of speech; and when we recollect that, in the 
midft of thofe nations who call themselves the friends of 
hberty and humanity, the moft barbarous of slaveries is jufti-
tified; and that it is even a problem, whether the understanding of negroes be of the same species with that of white men? The language formerly spoken by the Copts forms another argument in favour of the origin above ascribed to them. On the one hand the form of their letters, and the greater part of their words, demonstrate that the Greek nation, during the thousand years it continued in Egypt, has left deep marks of its influence; but, on the other, the Coptic alphabet has five letters, and the language a number of words, which are to be considered as the remains of the ancient Egyptian. These, when critically examined, have a sensible analogy with the dialects of the ancient neighboring nations, such as the Arabs, Ethiopians, Syrians, and even those who lived on the banks of the Euphrates; nor can it be doubted that all these languages are derived from one common stock. For upwards of three centuries, that of the Copts has fallen into disuse. The Arabs, disdaining the language of the nations they subdued, imposed on them, together with their yoke, the necessity of learning that of their conquerors. This obligation became even a law, when, about the end of the 6th century of the Hegira, the Caliph Waled I. prohibited the Greek tongue throughout his whole empire. From that time the Arabic became universal; and the other languages, confined to books, fulfilled only for the learned, who neglected them. Thus has been the fate of the Coptic. The priests and monks no longer understand it, in their scriptures and books of devotion in which alone it exists.

Mr. Browne, a late traveller in Africa, (p. 71.) does not admit this hypothesis of Volney; for he observes, that the Copts, or original inhabitants of Egypt, have no resemblance of the negro features or form; though they have some peculiarities of feature common to all. Their hair and eyes are of a dark hue, and the former is often curled; but not in a greater degree than is occasionally seen among Europeans. The nose is often aquiline; and though the lips be sometimes thick, they are by no means generally so; and on the whole, a strong resemblance may be traced between the form of visage in the modern Copts, and that presented in the ancient monuments, paintings, and statues. Their complexion, like that of the Arabs, is of a dulky brown; it is represented of the same colour in the paintings, seen by Mr. Browne in the tombs of Thebes. The Coptic women have interesting features, large black eyes, and a genteel form.

The Copts differ from the Arabs by their religion, which is Christianity, and which they embraced at an early period; but they are again distinct from other Christians by their opinions, which are those of the Euchyrians or Monophysites. Their adherence to these opinions has exposed them to the persecution of the other Greeks; and thus they are rendered irreconcilable enemies. When the Arabs conquered the country, they took advantage of these enmities, to enfeoff them both. The Copts, however, have at length expelled their rivals; and as they have been always intimately acquainted with the interior of the country, they are become the depositaries of the registers of the gilders of the lands and tribes. Under the name of "Writers," they are at Cairo the intendants, secretaries, and collectors of government. These writers, defiled by the Turks whom they serve, and hated by the peasants whom they oppress, form a kind of separate class, the head of which is the writer to the principal Bey. He dispenses all employments in that department, which, according to the spirit of the Turkish government, he bestows on the belt bidder.

The Copts endured many suffering, and were reduced to extreme poverty and distress by the intolerance and persecution of the Greeks; but when Ammon invaded Egypt, A.D. 688, the Copts availed themselves of the opportunity which was afforded by their voluntary submission to the conqueror for retaliation on their persecutors. The Saracens were received by them as the deliverers of the Jacobite church; and during the siege of Memphi a secret and effectual treaty was opened between a victorious army and a people reduced to the most abject distress and bondage. "The Greeks," said Mokawwas, a rich and noble Egyptian, connected with the Coptic sect, in his first conference with Amrou, "are determined to abide the determination of the sword; but with the Greeks I defire no commixion, either in this world or in the next; and I abjure for ever the Byzantine tyrant, his yoke of Chaledon, and his Mekhite slaves. For myself and my brethren, we are resolved to live and die in the profission of the gospel and unity of Christians. It is impossible for us to embrace the revelations of your prophet; but we are defirous of peace, and cheerfully submit to pay tribute and obedience to his temporal successors."

The tribute was ascertained at two pieces of gold for the head of every Christian; but old men, monks, women, children, of both sexes, under 16 years of age, were exempted from this personal affliction; the Copts above and below Memphis swore allegiance to the caliph, and promised an hospitable entertainment of three days to every Mussulman who should travel through their country. By this charter of security, the Copts obtained a triumph over their enemies, and the sacred edifices, with the patrimony of the church, were restored to the national communion of the Jacobites, which enjoyed without moderation the moment of triumph and revenge. From the superiority thus acquired, and the conduct by which it was obtained, and by which it was succeeded, proceeded that permanent and ineradicable animosity which hath subsisted between the Copts and the Greeks ever since their subjection to the Turks; and which the Romish millionaires have endeavoured to terminate, by using every method likely to reconcile both those sects to the church of Rome. In the 17th century attempts were made for uniting the Monophysites of Asia with the Romish church, and they were accompanied with a partial and temporary success; but the African Monophysites, and more especially the Copts, notwithstanding that poverty and ignorance which exposed them to the seductions of popery and gain, maintained their principles with firmness, and made an obstinate resistance to the promises, presents, and attempts, employed by the papal millionaires to bring them under the Roman yoke. The Copts, ever since the Saracen conquest above-mentioned, have had churches, priests, bishops, and a patriarch, who fixed his seat of residence at Cairo, when that city became the capital. In their worship they blend a number of superfluous customs, which have been transmitted to them from their ancestors and which they obstinately retain. In other respects, says Savary (Letters on Egypt, vol. ii.) the Copts are gentle, humane, and hospitable. Paternal tenderness and filial love constitute the happiness of their families. They honour and cherish all the ties of blood. The internal commerce, the art of hatching chickens, and that of bringing up bees, form almost their only sciences. They often acquire considerable wealth in the management of the affairs with which they are entrusted, but they are never allowed to enjoy the fruit of their labours in tranquility. The Bey, who feels their opulence, strips them without pity:—happy if they can secure their lives by the sacrifice of their fortune. These vexations, however, never excite them to revolt.

Then
C O P H T I.

Their want of energy keeps them chained down to servitude and misery, which they endure without murmuring. Mr. Browne represents the Copts as an acute and ingenious people, who get money readily without extortion, considering, that, under an arbitrary government, obscurity is safety. In their temperment, he says, they are melancholy, but, if called into action, indomitable and laborious. However, they are fond of their distilled liquors, and rather licentious in their amours. They are zealous in their faith, this writer adds, and their ecclesiastics are numerous. The populous city of Cairo, as we have said, affords a refuge, or rather a shelter, for their indigent patriarch, and remnant of 10 (some say 12 or 13) bishops; 40 monasteries have survived the depredations of the Arabs; and the progress of servitude and apathy has reduced the Coptic nation to the despicable number of twenty-five or thirty thousand families; a race of illiterate beggars, whose only consolation is derived from the finer wretchedness of the Greek patriarch and his diminutive congregation.

The Coptic patriarch, though he resides at Cairo, takes his title from Alexandria; and the body of the inferior clergy, whether secular or regular, is composed of the orders of St. Antony, St. Paul, and St. Macarius, who have each their monasteries.

Besides the orders of priests, deacons, and subdeacons, the Copts have likewise archimandrites, the dignity whereof they confer with all the prayers and ceremonies of a priest ordination. This makes a considerable difference among the priests; and besides the rank and authority it gives them with regard to the religious, it comprehends the degree and functions of archpriests. By a custom of about seven hundred years, if a priest elected bishop be not already archimandrite, that dignity must be conferred on him before episcopal ordination.

The second person among the clergy, after the patriarch, is the titular-patriarch of J rualem, who also resides at Cairo, because of the few Copts at Jerusalem; he is, in effect, little more than the bishop of Cairo: only he goes to Jerusalem every Easter, and visits some other places in Palestine near Egypt, which own his jurisdiction. To him belongs the government of the Coptic church, during the vacancy of the patriarchal fee.

To be elected patriarch, it is necessary the person have lived all his life in continence: it is he confers the bishoprics. To be elected bishop, the priest must be in the celibate; or, if he have been married, it must not be above once.

The priests and inferior ministers are allowed to be married before ordination: but are not obliged to, as Ludolphus erroneously observes. They have a great number of deacons, and even confer the dignity frequently on children. None but the lowest rank among the people commence ecclesiastics; whence arises that exclusive ignorance found among them: yet the respect of the laity towards the clergy is very extraordinary. Their office is longer than the Roman office, and never changes in any thing; they have three liturgies, which they vary occasionally.

The monastic life is in great esteem among the Copts; to be admitted into it, there is always required the consent of the bishop. The religious Copts make a vow of perpetual chastity; renounce the world, and live with great austerity in deferts: they are obliged to sleep in their cloaths and their girdle, on a mat stretched on the ground; and to prostrate themselves every evening a hundred and fifty times, with their face and breast on the ground.

They are all, both men and women, of the lowest class of the people; and live on alms. The monnaries are properly hospitalls; and few enter but widows reduced to beggary.

In the present habitation of the Coptic community is situated in the desert of Nitria, called also after the name of a famous saint denominated Macarius, and is distinguished by the appellation of "Za'di el Baramous," and called by the Arabs, "Kafr Zu'tit." It is an enclosure of high walls without any gate, unless that name should be given to a small wicket, which is opened only twice or thrice in the course of a year. Perons entering or leaving it are hoisted up and lowered down by means of a strong rope and a pulley. The building is entirely constructed of soft calcareous stones, several of which contain sottile shells. Within the walls there is a kind of small fort, surrounded by ditches, over which is built a drawbridge. Here the monks retire, when the Arabs succeed in forcing the outer walls. In this little fort are a church, a cellarm, and provisions; in short, everything for enabling the monks to sustain a long siege. Here they also keep their books, written in the Coptic language; which they cannot on any consideration be prevailed on to part with, although they never read them, and suffer them to lie on the ground, eaten by vermin and covered with dust. The cells of the monks are vaulted and very low, and are indeed no better than a sort of dens, not unsuitable to the ignorant and sottile wretches who inhabit them. The church is simple in its construction, and has no other ornament besides a few oil-rich's eggs, and bad pictures of saints. It is impossible, says Sommi, (Travel in Upper and Lower Egypt, p. 354,) to give an idea of the confusion that sometimes prevails in their church: they often know not what they are to sing: one will have a particular anthem or psalm, and another a different one: they then dispute and come to blows; in the mean time a third chants a prayer, which is followed by the choir, and thus the quarrel terminates. Their singing consists of Turkish and Arabic airs, accompanied by cymbals, the noise of which, mixed with their squalling voices, and their discordant music, makes the church re-echo with a medley of jarring sounds. The priest celebrates mass with water. They confecrate common bread; which the priest eats in pieces and mixes with water, which is likewise consecrated. This makes a kind of soups, of which he eats a few spoonfuls; and afterwards admixes the sacrament, also with a spoon, to all that are present. After the communion the priest washes his hands, and standing at the door of the chancel, extends them to invoke the face of every one who passes. During mass, the priest also blest little laves which are distributed at the close of the service. The priest who celebrates mass is drest in a kind of white shirt, made with a cowl, and covered with little croffles. During the other prayers, he only wears a large fillet of white linen, with similar little croffles, half twirled round his head in the form of a turban, with the two ends hanging down before and behind. In this convent there were only three priests and some friars, with a seclusion of persons who come either from time to time to do penance, and who bring the monks the means of subsistence. Their fare consists of bread, or rather biscuit, made of flour of lentils, and rice boiled in salt and water, bad cheese, and a little honey; and their only beverage is a brackish and ill-tasted water. Their supplies are conveyed to them from the alms of the rich Copts at Cairo. In these monasteries, several of which are found in this desolate country, the Coptic travellers through the desert are sure of finding necessaries for themselves and their horses; which they obtain by ringing a small
small bell, the cord of which hangs down on the outside.

F. Roderic reduces the errors and opinions of the Copts to the following heads: 1. That they put away their wives, and espouse others while the first are living. 2. That they have seven sacraments; viz., baptism, the eucharist, confirmation, ordination, faith, fasting, and prayer. 3. That they deny the Holy Spirit to proceed from the Son. 4. That they only allow of three ecclesiastical councils; that of Nice, Conantinople, and Ephesus. 5. That they only allow of one nature, will, and operation, in Jesus Christ, after the union of the humanity with the divinity: in other words, they are Monophysites, Monoothelites, or Eutychians. Mr. Browne (ubi supra) says, that they embrace transubstantiation; in which, and other points, the Catholics of Cairo think they apprehend their faith nearer than the Greeks. As to their errors in discipline, they may be reduced, 1. To the practice of circumcising their children of both sexes before baptism, which has obtained among them from the twelfth century. 2. To their ordaining deacons at five years of age. 3. To their allowing of marriage in the second degree. 4. To their forbearing to eat blood: to which some add their belief of a baptim by fire, which they confer by applying a hot iron to their forehead or cheeks.

Others palliate these errors, and show that many of them are rather abuses of particular persons, than doctrines of the sect. This seems to be the case with regard to their polygamy, eating of blood, marrying in the second degree, and the baptism of fire: as for circumcision, it is said not to be practised as a ceremony of religion, nor as of any divine appointment, but merely as a custom which they derive from the Jummalites; and which, perhaps, may have had its origin from a view to health and decency in those hot countries.

The Copts have adopted, from the Mahometans, the custom of frequent profrations during divine service; of ablution after the conjugal rites, &c. In many respects their faith, discipline, and worship, resemble those of the Abyssinians; see that article.

The Copts, at different times, have made several reunions with the Latins; but always in appearance only, and under some necessity of their affairs. In the time of pope Paul IV., a Syriac was dispatched to Rome from the patriarch of Alexandria, with letters to that pope; wherein he acknowledged his authority, and promised obedience: deferring a peron to be dispatched to Alexandria, to treat about a re-union of his church to that of Rome: purport to which, Pius IV., successor to Paul, chose M. Roderic, a Jesuit, whom he dispatched in 1561, in quality of apostolical nuncio.

But the Jesuit, upon a conference with two Copts deputed for that purpose by the patriarch, was made to know, that the titles of father of fathers, pater of fathers, and master of all churches, which the patriarch had bestowed on the pope in his letters, were no more than mere matters of civility and compliment; and that it was in this manner the patriarch used to write to his friends: they added, that since the council of Chalcedon, and the establishment of several patriarcha independent of one another, each was chief and master of his own church. This was the answer the patriarch gave the pope, after he had received a sum of money remitted to him from Rome, by the hands of the Venetian consoli.

COPHTIC, or Coptic, the language of the Copts, the ancient language of the Egyptians, mixed with a great deal of Greek; its alphabet being manifestly nothing else but Greek, with the addition of some few letters, to express sounds, which the Grecians had not, and which probably came to be used in Egypt after the time of Alexander, though we know that the Greek language, and perhaps also the Greek letters, were taught there long before, in the reign of Pharaoh Acheutschechenn. Of this affinity the reader may judge, by the following table of the Coptic alphabet:

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<tr>
<th>Name</th>
<th>Power</th>
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<tbody>
<tr>
<td>Alpha</td>
<td>A</td>
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<tr>
<td>Beta</td>
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<td>Gamma</td>
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<td>Delta</td>
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<td>Eta</td>
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<td>Zeta</td>
<td>Z</td>
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<td>Iota</td>
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<td>Kappa</td>
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<td>Lambda</td>
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</tbody>
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The old Coptic, which Kircher maintains to be a mother-tongue, and independent of all others, had been much altered by the Greek; for besides that it has borrowed all its characters from the Greek, with a very little variation, a great number of the words are pure Greek.

Vossius, indeed, affirms, that there was no Coptic language till after Egypt became subject to the Arabs. The language, according to him, is a mixture of Greek and Arabic: the very name thereof not being in the world till after the Arabs were masters of the country. But this, Mr. Simon observes, proves nothing; except that what was anciently called Egyptian, has since by the Arabs been called Coptic, by a corruption of speech. There are, it is true, Arabic words in the Coptic; which he by no means proves but that there was a language before that time, either Coptic or Egyptian. Pietro de la Valle observes, that the Copts have entirely left their ancient tongue; that it is now no longer understood among them; that they have nothing extant therein but some sacred books; and that they still say massa in it.

All their other books have been translated into Arabic, which is their vulgar tongue; and this has occasioned the originals to be lost; it is added, that they rehearse the Epistles and Gospels in the massa, twice; once in Arabic, and once in Coptic.

Indeed, if we believe F. Vandt., the Copts say the massa in Arabic, all but the Epistles and Gospels, which they rehearse both in that and Coptic.

It sufficiently appears, that, after the conquest by the Saracens, the ancient language so far continued to be that of religion, that it was used in the divine service; and in the country of the Copts, the gospel, according to Niebuh, is even now read in Coptic: but he observes, that this tongue is not understood even by the priests, and that the service is afterwards read in the Arabic, which is the present language of Egypt. Mr. Browne says, that in the Coptic monasteries, the prayers are read in Arabic, and the epistle
and gospel in Coptic; but the præfix is a mere parrot, respecting a dead letter.

The Coptic tongue, at present, confines chiefly of the old Egyptian and Greek, still bearing evident marks of primitive antiquity in its structure and constitution, with regard to which it differs so much from all the Oriental and European languages, that it is impossible to conceive it derived from any of them. For the Copts neither decline their nouns, nor conjugate their verbs, (not even those of foreign extract,) otherwise than by prefixing particles sometimes of one or more syllables, and sometimes of a single letter, which denote the case, gender, number, and person; several of them being often joined together in one word, and the primitive word usually placed last. Hence the difficulty of this tongue confounds in the incredible combination of the words and particles, in the change of the vowels, and in transposing the middle part of the word, and in adding superfluous letters: so that it requires great labour and skill to distinguish them.

From numerous and minute researches, Mr. Browne is led to affirm, that the Coptic language may be considered as extinct; although in Upper Egypt, they unwillingly return from Coptic words.

F. Kircher is the first who published a grammar and vocabulary of the Coptic. There is not known any book extant in the Coptic, except translations of the Holy Scriptures, or of ecclesiastical offices; or others that have relation to these, as dictionaries, &c.

Dr. Weid, who began his Coptic studies at Leyden, and was affiliated in them by Sahlorz, the editor of La Croze's Coptic lexicon, returned his obligations to the services which he rendered to him in that publication. He superintended the impression of the abridgment of it, which was published at Oxford, and there applied himself to the study of the Sahidic dialect, or that of the Upper Egypt. In 1758, he published the celebrated Coptic and Sahidic grammar of Sahlorz, under the following title: "Chris. Saholzos Grammatica Egypti orientis Diachil, quam breviariis, iliaque formaci. editi C. G. Weide." An excellent Coptic grammar was also published at Paris, in 1753, under the title, "Didacta Tauroctica Literaturae Copticae Rudimenta."

Coptic, or Coptic Bible. See Coptic Bibles.

Coptic Liturgies are three; one attributed to Bâl; another to St. Gregory, and the third to Cyril: they are translated into Arabic for the use of the priests and people.

COPHTOS, in Geography. See Coptos.

COPIA CLAUDIA AUGUSTA COLONIA, a name given to the modern Lyons.

COPIA CORNA. See Cornucopia.

COPIA libelli deherrandae, in Law, a writ that lay where a man could not get the copy of a libel at the hand of a judge ecclesiastical, to have the same delivered to him. Reg. Orig. 51.

COPLE, in Ancient Geography, a town of Italy, in the gulf of Tarentum; called also Sybaris.

COPM MILITAES, military forces, a military body instituted particularly by Augustus, for the defence of the Roman empire. It was divided into three classes or descriptions. The first, called cœpi cœlificæ, was destined to defend the seas and rivers against the incursions of pirates, and to protect navigation; the second, called cœpi provinciæ, defended the frontiers, and encamped on the midland towns, as necessity or occasion required; and the third, called cœpi urbana, remained at Rome, as a guard for the capital, and also for the emperor, in case of need.

COPM Provinciæ. See COPM Militæs.

COPM Urbana. See COPM Militæs.

COPF, in Geography, one of the thirteen provinces into which the kingdom of Chili in South America is divided. It is situated in the most northern part of the kingdom, and is one of the richest metallic countries in the world. In this province are two mountains entirely composed of crystallized sulphur, so pure that there is no occasion for refining it. It has also mines of gold, silver, iron, copper, and lead. The whole field is impregnated with sal-gem; and salt-petre is common. It furnishes also turquoises, that is, teeth or bone coloured green by metallic vapours. In this province and that of Coquimbo little rain falls; and earthquakes are seldom known in either of them. It has two ports; one of the same name, and another which lies 30 leagues further to the south, and confils only of a few huts.

COPÔPA, a town of Chili, in the former-mentioned province, to which it gives name; situated about 12 leagues from the sea-coast, very irregularly built, but containing between three and four hundred families. S. lat. 26° 50'.

COPÔPA, a river of S. America, in Chili, which runs into the Pacific Ocean, a little to the north of the town of Copiapo.

COPIATA, under the Western Empire, a grave-digger. In the first ages of the church, there were clerks defined for this employment. In the year 357, Constantine made a law in favour of the priests copiato, i.e. of those who had the care of interments, whereby he exempted them from the hultra contribution which all other traders paid.

It was under him also that they first began to be called copiato, q. d. clerks defined for bodily labour, from copâ, of copes, feon, evedo, ferio, i aci, bent, &c. Before that time they were called decani and delicatorii; perhaps, because they were divided by decades or tens, each whereof had a bier or litter for the carriage of the dead bodies. Their place among the clerks was the next in order before the chanters.

COPING over, in Carpenter, a fort of hanging over, not square to its upright, but bevelling on its under side till it end in an edge.

Coping, among Builders, signifies the top or covering of a wall. The best copings are of hewn stone, where it can readily be procured; in other situations, where large paving-bricks are made of a good and durable quality, these may with propriety be used flat for coping. Bricks of particular shapes are often made for coping, either to be used finely, or first a course of two bricks in width, to form a projection for shooting the wet off the faces of the wall, and then a half cylindrical brick for completing the coping. Several years ago, Mr. Peter Wych communicated to the Society of Arts in London (Doddie's Memoirs, vol. ii. p. 163) a method of making a durable coping for garden walls, of a mixture of baked gypsum and coal-ashes. We lately observed on the Grand Junction Canal, that several of their bridges have been repaired, where the coping stones were broken by accidents, with Parker's Roman cement, and that others of their bridges and walls were wholly coped with this composition, which appeared little inferior to stone in hardness, and less brittle than most kinds of coping-stones are. See CANAL, in Flony districts, where the fields are separated by rough and dry stone walls, the same are usually coped by a row of rough and triangular stones, set edgeways on the top of the wall. The cementing of these together with a little good mortar is a good practice. Where the stone is less hard or durable, these kinds of dry walls are sometimes coped with a circular ridge of good but very coarse mortar, prepared for the purpose. The practice of properly securing and
and attending to the copying of dry-built walls cannot be too much enforced, for want of which the rubbing of cattle and other accidents soon make breaches in such walls, that are very expensive to repair. In some counties, where stone is very scarce, and fuel for burning bricks very dear, garden and other walls are made of mud or tempered clay, with a mixture of chopped straw or flouke to hold them together; and fish are sometimes thatched with straw, by way of copying: for both thefe, and the peb walls, compos'd of dry earth rammed together in a mould, which have lately been introduced in England, must be carefully preserved from the wet by a secure copying, or they soon moulder into their original dirt.

COPLAND, in Geography, the name of a cluff of small islands in the north Channel, nearly opposite to Donaghadee, in the county of Down, Ireland. One of them has a few cabins upon it; and another has a light-house, which is very useful to those going to Belfast, or crossing the Channel between Donaghadee and Portpatrick. That which has the light-house on it is in W. long. 5° 24'.

N. lat. 51° 39'.

COPE, a vicarage in Bedfordshire, in Wixamtree Hundred, is remarkable for being formerly the residence of Sir Samuel Luke, and of Butler, the author of Hudibras, which celebrated poem is supposed to have been written at Wood-End house, in this parish. The Oufe navigation passes the northern extremity of this parish; and some years ago, a canal was made, a mile or more in length, for conveying barges up to a new house and premises, intended as a wharf, (now the Dog ale-houfe;) but for want of previous consent on the part of the owner of this part of the Oufe navigation, it was not permitted to be used. See Canal. The subtil or strata in this parish is clay throughout, with lime-stone at a considerable depth beneath the surface: for a considerable width next the Oufe the clay is covered with gravel, and produces good turnip land.

COPOS, from avoir, labour, in Medical Writings, is used for a weariness of the body, when the muscles, or their fibres rather, are loaded and obstructed with viscous humourous, so as to render them unfit for motion.

COPPA, in Cavalier, called Ant. Girolama, in Biography, an historical painter, who was born at Verona about the year 1503, and became successively the scholar of the celebrated Bolognese masters, Guido and Albano. He is considered one of the best imitators of the graceful and delicate manner of the former, although in his compositions he is sometimes too crowded; and he was ranked by his second master, Albano, amongst his most favoured disciples. He was one time painter to the court of Mantua, the churches of which city are enriched by many of his principal works. He died in the year 1665. Lanzi. Storia Pitt.

COPPA, in Law, a cop or cock of grins, hay, or corn, divided into tichetable portions; as the tenth cock, &c. This word in French denotes the gathering or laying up the corn in cops or heaps, as the method is for barley or oats, &c. not bound up, that it may be the more fairly and justly tithed: and in Kent they still retain the word, a cap or cap of hay, straw, &c.

COPPERBERG, in Geography, one of the twenty-eight governments into which the kingdom of Sweden is divided, comprising the province of Dalcarlia, is also called Fabhus, and Gamla Copperberg, old copper mines. It is a large, populous mine town, situated between two lakes and two mountains; 56 miles W. of Gelé, 24 N.E. of Hedemora, in N. lat. 6° 50'. The streets are regular, but the houses are all of wood, except the town's hall and two churches, the roofs of which are covered with copper. It is the fifth

teenth among the towns that vote in the Swedish diet. The governor resides at Neary, a royal manor near the town. The famous copper mine, which Gustavus Adolphus used to call the Swedish exchequer, lies a little to the west. It has been worked one thousand years, and its copper is still reckoned the best in Europe. From 1633 to 1761 it yielded 1,480,724 Swedish thippounds. Its greatest produce was in the year 1650, when it gave 20,381 thippounds. Since the year 1760, it yields nearly 6,000 thippounds annually; but the expenses increase in proportion, as the miners must go to a greater depth. In 1801, the mine was said to be 1000 feet deep, and to give employment to 1,000 workmen. The copper is found in large masses. Cattaneo Tableau de la Suede. Schlozer's Briefwechsel.

COPPEY, one of the small western islands of Scotland; 3 miles N. from the S.W. extremity of the island of Lewis.

COPPS, COPPEL, or COPPEL, in Chemistry. See CUPPELL.

COPPELLING. See CUPPELLATION.

COPPERBRUGGE, in Geography, a town of Germany, in the circle of Wedelphah, and county of Schleswig: 19 miles S.W. of Hanover.


Copper is a ductile and malleable metal, of a pale yellowish red colour. It is soluble in hot acids, and is precipitable from them in the metallic state, by iron or zinc: its oxyd is soluble in ammonia, to which it communicates a bright blue purple colour.

§ 1. Ores of Copper.


Its colour is a clear copper-red, often tarnished, externally yellowish, blackish, or whitish.

It occurs in mafs, disseminated, in leaves and grains, also capillary, moss-like, dendritic and crystallized. The regular forms that it presents, are the cube, the octahedron, and the pyramidal dolcatedehedron often with a short fix-sided prism interposed.

The crystals are small, and generally implanted in each other, forming clustered masses. Its lustre internally is glittering and metallic; its fracture is hackly: when cut or rubbed, it acquires a high metallic lustre. It is not very hard, is malleable and flexible, but not elastic, is tough and difficultly fusible. Sp. gr. 5.72—5.8.

It is fuitable before the blow-pipe, and appears to be pure copper.

It occurs in veins and beds in various primitive and secondary mountains, accompanied by many of the other ores of copper, also by galena, Born silver, native silver, calcareous, liegy, and floor spars.

It is very extensively, but not very abundantly, diffused; the largest masses appear to be procured from the copper mine river, within the arctic circle in North America; it is also of frequent occurrence in Japan and Brazil, in Siberia, Hungary, Norway, Sweden, Saxony, and Cornwall.


Its colour is dark lead-grey, passing into blackish-grey; it is often covered superficially by a fleck-coloured tarnish. It occurs in mafs, disseminated or crystalized. The forms of its crystals are the cube, the octahedron, and a hexagonal prism, sometimes terminated by trilateral summits. The crystals are small; externally they are shining, internally they exhibit a glittering metallic lustre. The fracture is fine-grained, uneven, passing into conchoidal. It gives a shining
COPPER.

Shining flake, is blackish when pulverized; is somewhat brittle, and easily friable. Sp. gr. 4.1—5.4.

It effervesces with nitrous acid, and when exposed to the blow-pipe, gives a metallic lustre of a steel-grey colour, and generally attractive by the magnet.

When pure, it appears to be a simple sulphuret of copper, containing, according to Chenevix, of

<table>
<thead>
<tr>
<th>81</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>Sulphur</td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

...It is generally however mixed with iron in the proportion of from 3 to 6 per cent. A specimen from Siberia was analyzed by Klaproth, and afforded

<table>
<thead>
<tr>
<th>78.5</th>
<th>Copper</th>
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</thead>
<tbody>
<tr>
<td>18.5</td>
<td>Sulphur</td>
</tr>
<tr>
<td>2.25</td>
<td>Iron</td>
</tr>
<tr>
<td>0.75</td>
<td>Silex</td>
</tr>
<tr>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

It occurs in veins and beds in primitive and secondary mountains, accompanied by copper pyrites, and other ores of this metal. It is not very abundant, but is found in various places, especially Cornwall, Hungary, Saxony, Norway, and Siberia.

Sp. 3. Variegated copper. Buschkupfererz. Its colour is intermediate between copper-red, and Tombeck brown; by exposure to the air it acquires a superficial tarnish, which is first reddish, then violet, afterwards blue, and lastly green. It occurs in mafs, disseminated, superficial, or crystallized in octahedrons. Internally it is shining, with a metallic lustre. Its fracture is small, and imperfectly conchoidal, passing into fine-grained, uneven. It takes a polish by friction, and gives a reddish coloured flake. It is soft, somewhat brittle, and easily friable. Sp. gr. 4.9—5.4.

It effervesces with nitrous acid, and melts readily before the blow-pipe, without vapour or odour. Two specimens, the one from Hitterdahl in Norway, and the other from Rudcladt in Siberia, have been analyzed by Klaproth, with the following results.

<table>
<thead>
<tr>
<th>Hitt.</th>
<th>69.5</th>
<th>Copper</th>
</tr>
</thead>
<tbody>
<tr>
<td>19</td>
<td>10</td>
<td>Sulphur</td>
</tr>
<tr>
<td>7.5</td>
<td>5</td>
<td>Oxygen</td>
</tr>
<tr>
<td>100</td>
<td>100</td>
<td></td>
</tr>
</tbody>
</table>

...This ore occurs in beds, veins, and disseminated through rocks, for the most part belonging to the class of primitive. It is usually accompanied by vitreous copper, and copper pyrites. It is found in Cornwall, in Hungary, Saxony, Norway, and Sweden.


Its colour is deep brafs-yellow, passing into gold-yellow. Its surface is often iridescent tarnished. It occurs in mafs, disseminated, superficial, foliaceous, clustered, reniform and crystallized in tetrahedrons, and the derivative octahedron, and dodecah-dron. The crystals are usually very small and imperfect. The surface of the crystals is smooth and shining; that of the other varieties is rough and glimmering. The fracture is coarse or fine-grained, uneven, passing into conchoidal, and imperfectly foliated. It is brittle, and with difficulty gives a few feeble sparks with the flint: it may be readily cut by a knife. Sp. gr. 4. — 4.1.

When exposed to the blow-pipe on charcoal, it decrystallizes, emits a sulphurous vapour, and melts into a black globule, which, by further application of heat, acquires the colour and lustre of copper. It does not appear that the crystallized varieties of this ore have been regularly analyzed, and the proportion of its constituent parts cannot be eliminated from the other varieties, on account of the iron pyrites, with which they are always more or less mixed. A specimen analyzed by Lapidus afforded

| 44 | Copper |
| 17.1 | Iron |
| 45.1 | Sulphur |
| 125.2 |      |

...The richest ore is in copper, the softer it is, and its colour approaches the more to that of gold. It is feldom, however, in the large way, affords more than 20 per cent. of copper. It may readily be distinguished from iron pyrites (the only substance with which it is likely to be confounded) by the pale brafs yellow colour, and superior hardness of the latter.

Copper pyrites is the most abundant, and most generally diffused of any of the ores of this metal. It occurs in veins and beds in primitive, transition, and secondary rocks, in most countries of the world.


Its colour is intermediate between silver-white and brafs-yellow. It occurs in mafs or disseminated. Internally it has a slight metallic lustre. Its fracture is small, and fine-grained uneven. It yields readily to the knife, is brittle, and easily friable. Sp. gr. 4.5.

Before the blow-pipe it yields a white smost, and an arlenical colour, and melts into a blackish flag. According to Henckel it yields about 40 per cent. of copper, the rest being iron, arsenic, and sulphur.

It occurs in veins and beds, in primitive mountains, and is generally accompanied by copper pyrites and vitreous copper.

It is found in Cornwall, Saxony, Sileia, Hungary, Siberia, and Chili in South America.


Its usual colour is steel-grey, which passes into iron-black and lead-grey; some varieties incline towards yellow and others again present superficial iridescent colours. It occurs in mafs, disseminated or netting, or crystallized in regular tetrahedrons and their modifications. The crystals are small, with shining surfaces. Internally it is glistening, or shining with a metallic lustre. The fracture is coarse, and small-grained, uneven, inclining to imperfectly conchoidal. It gives a black or reddish-brown powder. It is moderately hard, brittle, and easily friable. Sp. gr. 4.45—4.36.

The only necessary ingredients of this species (as appears from an analysis by Chenevix; of the crystallized variety) appear to be copper, iron, and sulphur in the following proportions, v i.

| 52 | Copper |
| 33 | Iron |
| 14 | Sulphur |
| 99 |      |

...The uncrystallized varieties, however, generally contain also antimony, silver, and lead, but in very variable proportions.
COPPER.

In several varieties from Germany, Mr. Chenevix found antimony varying in proportion from 5 to 38 per cent., but neither lead nor silver. Two specimens, the one from Andeeesberg, and the other from Crannitz, have been analyzed by Klaproth with the following results.

<p>| | | | |</p>
<table>
<thead>
<tr>
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<tbody>
<tr>
<td>Copper</td>
<td>31.36</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Iron</td>
<td>3.3</td>
<td>17</td>
<td></td>
</tr>
<tr>
<td>Sulphur</td>
<td>11.5</td>
<td>10</td>
<td></td>
</tr>
<tr>
<td>Antimony</td>
<td>34.09</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>Silver</td>
<td>14.77</td>
<td>2.25</td>
<td></td>
</tr>
<tr>
<td>Lead</td>
<td>0</td>
<td>3.4</td>
<td></td>
</tr>
<tr>
<td>Silex</td>
<td>0</td>
<td>2.5</td>
<td></td>
</tr>
</tbody>
</table>

05.02 93.75

Finally, a specimen from Piedmont has been examined by Napoleon, and found to consist of

<p>| | |</p>
<table>
<thead>
<tr>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>29.3</td>
</tr>
<tr>
<td>Iron</td>
<td>12.1</td>
</tr>
<tr>
<td>Sulphur</td>
<td>12.7</td>
</tr>
<tr>
<td>Antimony</td>
<td>36.9</td>
</tr>
<tr>
<td>Silver</td>
<td>0.7</td>
</tr>
<tr>
<td>Arsenic</td>
<td>4.7</td>
</tr>
<tr>
<td>Alumina</td>
<td>1.4</td>
</tr>
</tbody>
</table>

96.8

Those specimens that give a reddish-brown streak, are generally the most abundant in silver.

It occurs in veins in slates, and some other of the newest primitive rocks, and in beds in the transition and flint rocks. It is accompanied by copper pyrites, galena, manganite, fpa-thoe iron, and rarely by malachite. When it contains a notable proportion of silver, it is considered and worked as an ore of this metal.

It is found in Cornwall, and in the county of Ayr in Scotland; also in Bohemia, Hungary, Transylvania, Saxony, Hesse, the Hartz, France, Spain, Piedmont, Sweden, Norway, Siberia, and Chili.


Its colour is intermediate, between blueish and brownish black. It occurs in mafs, disseminated or involving. It is composed of dull moderately coherent particles. It is friable, slightly soles the fingers, is meagre to the feel, and heavy.

Before the blow-pipe it emits a sulphurous odour, and melts into a flag that colours borax green. It has not been regularly analyzed, but is said to contain from 40 to 50 per cent. of copper.

It occurs with other ors of copper, particularly copper pyrites, malachite, mountain green, and vitreous copper.

It is found of remarkable beauty, at Kupperberg, in Silesia, also in Saxony, Hungary, Norway, and Siberia.


Of this species, there are the three following varieties.

Var. 1. Lamellar.

Its colour is dark cochineal red, inclining sometimes to lead grey; when crystallized it is often of a full carmine red. It occurs in mafs, disseminated and crystalized in cubes, and aluminous octahedrons. The crystals are small, and for the most part laterally aggregated: their faces are smooth and shining. Its internal lustre is more or less flinty, and is intermediate between metallic and adamantine. Its fracture is imperfectly foliated, passing into granular uneven. When in mafs it is usually opaque, or at most translucent on the edge; the crystals are transparent, verging into translucent. It gives a brownish brick-red streak, is moderately hard, brittle, and easily friable. Sp. gr. 3.05.

By exposure to the blow-pipe on charcoal, it is easily reducible to a metallic bead, without emitting either odour, or fume. It dissolves in the nitrous and muriatic acids, in the former with, and in the latter without, effervescence. According to Mr. Chenevix, it consists of

<p>| | |</p>
<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>copper</td>
<td>88.5</td>
</tr>
<tr>
<td>Oxygen</td>
<td>11.5</td>
</tr>
</tbody>
</table>

100.

It is met with chiefly in veins, and appears to be peculiar to primitive mountains. It is accompanied by native copper and other ores of this metal. It is found in Cornwall, in Hungary, Saxony, the Hartz, Siberia, Peru, and Chili.

Var. 2. Capillary.

This variety differs from the preceding in being of a somewhat lighter colour, superior lustre, and being composed of small capillary crystals and thin flakes.

Var. 3. Compacè.

It occurs in mafs and disseminated, but never crystallized. Its internal lustre is glimmering, semi-metallic: its fracture is even; and it is opaque. In other respects it agrees with var. 1.


This species presents two varieties, indurated and earthy.

Var. 1. Indurated.

Its colour is intermediate between hyacinth and brownish-red, passing on the one hand into lead-grey, and on the other into reddish-brown. It occurs massive and disseminated. The reddish kind has a glimmering lustre and flat conchoidal fracture; the brownish kind has a somewhat pearly lustre and a small conchoidal fracture. It acquires a lustre by friction, is moderately hard and brittle.

When exposed to the blow-pipe it becomes black, and is insubstantial without addition. Borax is tinged by it of a dirty green. It appears to be an intimate mixture of compound ruby copper with brown iron ochre, and its produce of copper varies from 10 to 50 per cent.

It occurs in veins with ruby copper, malachite, copper pyrites, and iron ochre.

Var. 2. Earthy.

Its colour is hyacinth-red, passing into reddish or yellowish brown. Its texture is between friable and solid. It occurs in mafs, disseminated, and involving copper pyrites. It is without lustre, has an earthy fracture, and slightly soles the fingers. In its other characters it agrees with the preceding variety.


Of this there are the two following varieties.

Var. 1. Radiated.

Its principal colour is sky-blue, which passes into Prussian and indigo-blue. It occurs in mafs, disseminated or involving, more frequently botryoidal, flake-like, and cellular, but most frequently crystallized in oblique rhombohedral prisms or octahedral prisms with dihedral funnels. The crystals are generally very small and aggregated into globular masses or bundles. The crystallized varieties are externally shining, but the rest are dull. Internally it is shining or glittering, with a lustre between vitreous and resinous. Its fracture is straight or divergently radiated, rarely lamellar. The crystals are translucent and semi-transparent, the other varieties are
COPPER.

are opaque, or at most translucent on the edges. When pulverized it is of a sky-blue colour. It is soft, brittle, and easily frangible. Sp. gr. 3.2—3.4.

It is very difficult of fusion before the blow-pipe, per fe; but with borax it gives a bright green glafs, and a metallic globule.

According to Pelletier it consists of

66 to 70 Copper
8 — 20 Carbonic acid
8 — 10 Oxygen
2 — Water

Var. 2. Earthy.

Its colour is smalt-blue: it occurs rarely in mafs, generally disseminated or superficial: it is conftructed of fine pulverulent cohering dull particles. Its fracture is fine-grained earthy, paffing into even and imperfectly conchoidal. It is opaque, lightly clay, and is easily frangible.

Before the blow-pipe it becomes black, but does not melt. In borax it dilolves with great ebullition, and forms a green glafs.

Mountain-green occurs in the newer primitive rocks, but more commonly in flotz mountains. It accompanies other ores of copper, efpecially malachite, grey copper, and copper pyrites. The most beautiful fpecimens come from the Bansat in Hungary, and from Siberia. In the Tyrol it is found in sufficient plenty to be manufactured into the pigments called mountain-blue.

Sp. 11. Malachite.

Of this there are the two following varieties.

Var. 1. Fibrous.

Its common colour is grafs-green paffing into emerald-green, and sometimes into dark leek-green. It seldom occurs massive or diffeominate, but generally infert, and coarsely crystallized in short capillary needles, dиффузо in divergent bundles, or ftars. Externally they are fhining, but internally only glifthing with a silky luftr. Its fracture is delicate, diverging fibrous, paffing into coarser fibrous. It is opaque or translucent on the edges; the crystals are for the most part translucent. When pulverized it retains its colour, only the tint is somewhat lighter. It is very soft, brittle, and easily frangible. Sp. gr. 3.5.

It efteffes with acids, and forms a blue folution with ammonia. Before the blow-pipe it blackens and decrpetiates, but is infubfible, per fe. With borax it melts into a green glafs. Its confluent parts, according to Klaproth, are

| 58 Copper |
| 18 Oxygen |
| 12.5 Carbonic acid |
| 11.5 Water |

100

It occurs ufually in the newer primitive and flotz mountains, accompanied by other ores of copper, also by carbonat of lead, calcareous fpar, brown fpar, and quartz. The finest fpecimens of this variety of malachite are found in the Siberian and Hungarian mines; it occurs also in Saxony and other mining districts in Germany, in Norway, and in Shetland, and the counties of Cornwall and Derby in Britain.

Var. 2. Compact.

Its colour is emerald-green paffing into grafs and verdigris-green, the fame fpecimens exhibiting different shades of colour: its external surface is commonly overfpread with a greenish-white crust. It occurs massive and diffeominate, but more frequently reniform, bontroyidal, mamilated, talcoidal, or globular. Externally it is rough and dull; inter-

nally it is, according to the fracture, either dull, glifthing, or fhining. Its fracture is conchoidal, or fine-granular uneven, or minutely fibrous. It generally occurs in thin lamellar concentric distint concretions, each of which has ufually a different shade of colour. It is opaque, soft, brittle, and easily frangible. Sp. gr. 3.5—3.6.

Its chemical characters and component parts are nearly the fame as those of the preceding variety, with which it also agrees in its geognolical and geographical fition.

Its beautiful colour, luftr, and the high polifh that it is capable of receiving, render it much sought after for various ornamental purposes; it would however be much more efteffed if it was harder.


Its colour is verdigris-green, paffing occasionally into emerald-green, and sky-blue. It occurs in mafs, diffufed or infert. Internally it is fhining paffing into glifthing, with a refulous luftr. Its fracture is small conchoidal. It is translucent and semi-transparent; is soft and easily frangible.

Its chief chemical character is that of giving little or no effeconomy, while diffufing in acids. It has not been analyzed. It is found in similar fitions with malachite, but is of much rarer occurrence.


Its colour is emerald-green. It occurs crysfallyzated in lengthened dodecahedrons. It is fhining both externally and internally, and has a vitreous luftr. It is translucent, paffing to semi-transparent; fcratches glafs feebly, and with difficulty; is brittle. Sp. gr. 3.3.

Before the blow-pipe it becomes of a chefnut-brown colour, and is infubfible, per fe. With borax it gives a bead of copper. According to an analysis by Vauquelin its consists of

25.57 Oxyd of copper
42.85 Carbonat of lime
28.57 Silex

96.09

It has hitherto been found only in Daauria on the Russian and Chinese frontiers in a vein accompanied by malachite.


Its colour is deep emerald-green paffing to verdigris-green. It occurs massive, diffufed, and crysfallyzated in hexahedral tables. Externally it is smooth and fhining with a pearly luftr. Its fracture is foliated. It is translucent paffing into semi-transparent. It is fofter than calcarious fpar. Sp. gr. 2.54.

It decrpetiates ftrongly when suddenly heated, and is compofed, according to Chenexis, of

| 58 Oxyd of copper |
| 21 Arfenic acid |
| 21 Water |

100

It is found in Huel Gorland mine in Cornwall, in veins accompanied by vitreous copper, copper pyrites, arfenic pyrites, and Ifon ochre.

Sp. 15. Octahedral arfienat of copper. Limonerz of Werner.

Its colour is deep sky-blue, paffing into Prussian-blue, blueish-white, apple-green, and grafs-green. It occurs in obtuse pyramidal octahedrons. The crystals are small and aggregated into clufers; they have a fhining vitreous luftr, and

5
and a lamellar fracture, are semi-transparent passing into transparent. In hard slate they are inferior to fluor spar. Sp. gr. 2.88.

It is composed, according to Chenevix, of

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxyd of copper</td>
<td>49</td>
</tr>
<tr>
<td>Arsenic acid</td>
<td>14</td>
</tr>
<tr>
<td>Water</td>
<td>35</td>
</tr>
<tr>
<td>Glass</td>
<td>1</td>
</tr>
</tbody>
</table>

It is found in the same mine as the preceding species. Sp. 16. Foliated arseneut of copper. Blaufrei olivaceus of Werner.

Its colour is olive-green, palling to oil and leek-green. It occurs rarely massive, and generally crystallized in acute rhombohedral oblique quadrilateral prisms. The surfaces of the crystals are smooth and shining. Internally, it is glintening with a silky lustre. Its fracture is fine and diverging fibrous. It is opaque, and moderately hard. It contains, according to Klaproth, of

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxyd of copper</td>
<td>68.13</td>
</tr>
<tr>
<td>Plutphoric acid</td>
<td>30.95</td>
</tr>
</tbody>
</table>

It has hitherto been found only at Fincberg in Cologne, in white dusty quartz. Sp. 19. Sandy copper. Salt-hotpern. Werner.

Its colour is emerald-green, palling into leek and olive-green. It occurs massive, disseminated, and crystallized in extremely minute fix or four-sided prisms. The surfaces of the crystals are smooth and brilliant, and their fracture lamellar. The massive variety is opaque; the crystals are transparent. It is soft and easily frangible. Sp. gr. 4.43.

Before the blow-pipe on charcoal, it tinges the flame of a bright green and blue colour, and a metallic globule remains behind. It is soluble in nitrous acid, without effervescence. The following are its constituent parts, according to Proult and Klaproth.

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oxyd of copper</td>
<td>76.595</td>
</tr>
<tr>
<td>Arsenic acid</td>
<td>10.638</td>
</tr>
<tr>
<td>Muricatic acid</td>
<td>10.1</td>
</tr>
<tr>
<td>Water</td>
<td>12.707</td>
</tr>
</tbody>
</table>

It is found loose in the bed of a river at Kornolino, in Chili, and elsewhere, though rarely in Spanish South America.

§ 2. Assay and Analysis.

The assay of copper ores, (though by no means so accurate a method of ascertaining their metallic contents as a regular analysis) being the method by which the market price of the ore is always determined, requires the first notice. The best method, upon the whole, of conducting it, is as follows.

First, expose a small piece of the ore, under examination, to the action of the blow-pipe, and by the appearance and odour of the vapour given off, it is easy to discover whether it contains any arsenic or sulphur. It may very probably contain both, in which case, take 300 grains of the ore coarsely pulverized, mix it with half its weight of fawdull, and keep it at a moderate red heat in a earthen crucible, till the disengagement of arseneut vapour entirely ceases. Then pour the contents of the crucible into an iron mortar, and reduce them carefully to a fine powder. Transfer this powder to a tell, and expose it to a good red heat, with occasional stirring, till both the charcoal and sulphur are burnt off. The residue is then to be accurately mixed with \( \frac{1}{2} \) of its weight of lamp-black, half its weight of pulverized glafs of borax, and a drop or two of oil; the mals thus formed, is to be put into a found earthen crucible, a cover is to be luted on, and the whole is to be placed in a good wind furnace. The heat should be moderate for the first quarter of an hour, to allow the borax time to combine with the earthy impurities of the ore; then a moderate white heat is to be applied for about twenty minutes. After this, the crucible being withdrawn and cooled, is to be care-
fully broken, and will be found to contain a button of copper, covered by vitreous scoria. The purity of the copper thus procured, it is to be estimated from its colour, lustre, malleability, and tenacity; after which, a part of it may be employed with pure lead, in order to ascertain whether it holds any silver or gold. If the ore contains sulphur, but no arsenic, it may be mixed with half its weight of charcoal, and roasted on a tekst, without being previously heated in the crucible. If the ore contains neither sulphur nor arsenic, it should be first moderately ignited in a covered crucible, to drive off any moisture, and then be treated with burax and lamp black, as already described.

The proper analysis, by means of liquid menstrua, is however much more accurate than even the most carefully conducted alloy, and the general mode of proceeding with the ores of copper is, upon the whole, very simple. The copper, together with the other metals with which it may happen to be mixed, is to be separated from the flux and sulphur, by means of an acid, the other metals are then to be got rid of by their appropriate reagents, and the copper is then to be procured either in the state of green borax, of black oxide, or of pure metal; of the first, 150 parts are equivalent to 100 of metallic copper; and of the second, 100 parts contain 85 of metal.

Preceding to undertaking an analysis, a part of the specimen, under examination, should be subjected to the usual reagents, in order to ascertain not indeed the proportion, but the nature of the ingredients of which it consists; and, in few cases, it is more necessary than in the analysis of the ores of copper, both as they are so numerous and so various in their composition. This previous examination being duly performed, the analysis may be conducted in the following manner:

For the analysis of the prismatic, and other sulphurized ores of copper, provided they contain neither silver nor lead, take 200 grains of the pulverized ore, and digest it at a boiling heat with muriatic acid, (adding occasionally a few drops of nitric acid) till every thing soluble in this menstruum is taken up. Of the insoluble portion, a part, consisting chiefly of sulphur, will be found floating on the liquor; and this being washed, dried, and weighed, is to be ignited on a stool, by which the sulphur will be burnt off, and its amount may be estimated from the loss of weight sustained by the process. The incombustible residue is to be digested in a little warm muriatic acid, and what remains insoluble, is to be added to the other insoluble residue. The muriatic solutions being mixed together, the whole is to be decomposed by carbonated potash, and the precipitate, hence resulting, is to be digested in repeated portions of caustic ammonia, as long as this latter acquires any blue tinge. The whole of the copper, and nothing else, will thus be taken up by the ammonia, from which it may be obtained in the state of black oxide, by the addition of a little caustic potash, and a boiling heat. The residue, insoluble in ammonia, consists of oxide of iron, with perhaps a little alumine, which may be separated from caustic potash, the alumine alone being soluble in this fluid. Finally, the portion insoluble in muriatic acid, may be considered as little else than flux.

The ores which, besides copper, sulphur, and iron, contain silver, lead, and antimony, may be thus analyzed. The ore, reduced to fine powder, is to be repeatedly digested with moderately diluted nitric acid, as long as any thing continues to be taken up by this menstruum. To the nitric solution as then to be added muriat of soda, which will throw down the silver in the state of luna cornea; this being separated, the lead is to be precipitated in the form of sulphate, by sulphate of soda; the solution is now to be supersaturated with ammonia, which will diffuse the copper, and raise behind the oxide of iron, with probably a little alumine and flux. The copper is to be procured from the ammoniacal solution, in the manner directed in the preceding paragraph; and the oxide of iron may be separated from the admixed earths, by caustic potash. That portion of ore, insoluble in nitric acid, is to be digested in muriatic acid, which will take up every thing except the sulphur, flux, and probably a little luna cornea. Of this insoluble residue, the sulphur is to be burnt off by gentle ignition, and the remainder is to be fused with twice its weight of pearl ash, by which the silver in the luna cornea will be reduced to the metallic state. The muriatic solution being concentrated by evaporation, and then poured into a considerable quantity of water, will deposit the anniversary in the form of a white oxide.

The simple oxides of copper, are best analyzed by digestion in nitric acid, and then supersaturating the solution with ammonia, by which any casual admixture of iron will be separated.

The carbonates of copper are to be thus treated. One portion is to be gently calcined in a covered crucible, and the loss of weight sustained, indicates the united amount of the water and carbonic acid. A second portion is to be thrown into a known quantity of dilute sulphuric acid, and the loss of weight, by the effervescence which ensues, shows the amount of carbonic acid. The fulminate of copper thus obtained, may be subqently decomposed, either by a flick of zinc, or by liquid ammonia.

The arseniates of copper are most conveniently analyzed by first moderately heating them, in order to drive off and thus estimate the water, and then digesting the residue in dilute nitric acid, by which it will be entirely dissolved; nitrat of lead is then to be dropped in as long as it occasions any precipitation, and this latter being removed, the fluid is to be evaporated nearly to dryness, after which, warm alcohol is to be added, which will take up the whole, except a little powder; this powder, and the precipitate on the addition of nitrat of lead, are arsenat of lead. 33.66 per cent. of which is arsenic acid. The alcoholic solution is then to be evaporated nearly to dryness, and then to be digested with ammonia, which will take up the copper, leaving behind any oxide of iron that may have happened to be contained in the ore. The ammoniacet of copper, being decomposed by caustic potash, gives the copper in the state of black oxide, which is that in which it exists in the ore.

The analysis of muriat of copper is very simple. It was thus effected by Klaproth. The ore, being pulverized, was distilled in cold nitric acid, with the exception of 1.5 per cent. of oxide of iron; the solution being then diluted, nitrat of silver was added, till it occasioned no further precipitation; the luna cornea thus obtained, indicates, according to the known proportions of this salt, the amount of muriatic acid in the ore. The nitrous solution was then decomposed, and the copper obtained in the metallic form, by means of a bar of iron.

Phosphat of copper was thus analyzed by Klaproth. On digestion in nitric acid, the whole was taken up except a few grains of quartz; the excess of acid in the solution was then saturated with potash, and acetate of lead was poured in till it had quite ceased to occasion any precipitation; the phosphat of lead, thus obtained, was separated from the solution, and sulphate of soda was added to decompose and precipitate
precipitate the small excess of acetate of lead which had been made use of. A little sulphuric acid was then added to the solution, and the copper was precipitated in the usual way, by means of a bar of iron.

§ 3. Reduction of Ores.

The only ores of copper that are in fact worked in the large way, and from which the copper of commerce is for the most part supplied, are the sulphurous and arsenical ores of this metal. The method of reducing them, though consisting of a great number of processes, on account of the powerful affinity, both of the arsenic and sulphur, is yet harmless the solubility of copper, and renders the obtaining of the metal by the aid of repeated roastings and fusions, till the metal has acquired the necessary ductility, for it is never brought to a state of absolute purity, and the commoner forms contain both arsenic and antimony, in such proportions, as to be wholly unfit for alloying with either gold or silver.

The rough ore, if simply sulphureous, is broken into pieces not larger than an egg, and leached as much as possible from the adhering earthy impurities; after which, it is piled in large kilns, and heat being applied at the bottom, the whole mass becomes gradually heated, and a large portion of the sulphur sublimes out, and may be either collected by proper flues, or allowed to escape; this first process occupies about six months, at the expiration of which time, the evaporation of the sulphur ceases, and when the ore has cooled sufficiently, it is in a state to be smelted.

If, however, the ore is largely combined with arsenic, it is not capable of keeping up a long combustion of itself, nor is the heat thus generated adequate to the expulsion of the arsenic; a somewhat different method, therefore, of roasting must be had recourse to. For this purpose the ore is first more carefully dried than in the former case, and is reduced to pieces not larger than a hazel-nut. It is then spread on the floor of a large reverberatory furnace, and exposed to a dull red heat, with frequent stirring, in order to offer fresh surfaces to the action of the flame. The arsenic and sulphur by this treatment are rapidly driven off, and in about twelve hours the roasting is completed.

The ore is now transferred into the fusil furnace, which is a reverberatory of the common construction; a little bruised line-shaped is generally added by way of flux, and in the course of four or five hours the fusil is ultimately complete; the flag, now the confine of the hot dough, is raked off, and the copper is discharged through a plug-hole into water, by which it is reduced into small drops or grains.

The copper, however, though in the metallic state, is still very impure, being largely mixed with sulphur and arsenic, which give it a grey colour, and render it perfectly brittle. In order to separate these impurities, it is remelted and granulated twice more or oftener, the considerable quantity of flag being separated at each fusion; but as this flag contains some copper, it is not thrown away, but worked over again with the next charge of calcined ore. The number of fusions and granulations entirely depend on the quantity of impurities, and the ability in which they combine with the copper; but when these processes have been repeated the requisite number of times, the granulated mass is melted and cast into pigs. These again are broken to pieces, and roasted for one or two days in a low red heat, and again melted and roasted several times, till the metal approaches to the state of malleable copper. It is now cast into oblong plates, about 14 inches in length, and is fit for the refining furnace. In this it is again melted, with the addition of a little charcoal, till it acquires the necessary degree of malleability, and thus becomes fusible copper.

Sometimes lead is employed with good effect in the refining of copper, as it combines with, and separates iron, and the other unly oxide metals in preference to copper. For this purpose the rough copper is laid on the floor of a furnace, and when it is in a complete fusion, about 6 or 8 per cent. of lead is blown in, and well mixed with the melt. In a short time the surface of the melted mass becomes covered with a semi-vitreous blackish brown layer, consisting of the mixed oxides of lead, iron, and other impurities, together with a little copper. The first copper being removed, a second is formed, which is in the manner comminuted off, and on successively, till, after ten or twelve hours, the copper is sufficiently purified; this is ascertained by the thinness of the film with which the melted copper is covered, and by its being of a brick-red colour, also by the circumstance that if a rod of polished iron is dipped into the fused mass the portion of copper that adheres to it immediately falls off when the rod is dipped in cold water.


The colour of copper is yellowish red; its hardness is superior to that of silver, but somewhat inferior to that of platinum; it is very tough, ductile, and malleable; hence it may be beaten into plates or drawn into wire of great strength and compactness. It breaks with a half-cleavage fracture. When rubbed, it emits a disagreeable odour; to the touch it is naiscent and hypsody. The specific gravity of Swedish copper, which is the purest that is met with in commerce, amounts to about 8.6; that of the commoner forms does not exceed 8.6 to 8.8; while that of the Japanese copper, on the other hand, amounts, according to Bergman, to 8.9.

The fusil point of copper is nearly the same as that of gold, namely, a low white heat; before it melts, changeable prismatic colours appear on its surface. When in fusion, or even at a full red heat, if exposed to the air, it is soon covered with a thin brittle plate of brownish oxide, that readily separates from the metal when cold.

This substance is an imperfect oxide, and was formerly called copper after, or fusion, or cina oxide, and by repeatedly heating and cooling a bar of this metal, the whole may be thus changed. These scales, according to Prout, are composed of about 65 per cent. of perfect or black oxide, and 35 of copper nearly in the metallic state; hence, when they are dusted in cold dilute sulphuric acid, only the former portion is taken up. By subsequent calcination, the scales are wholly converted into black oxide, the weight of which is one-fourth more than that of the original copper. At a very high heat, this oxide runs into a bright redish-brown opake glass.

Copper, when in high fusion, and in contact with the air, like all the other easily oxideable metals, is actually combustible; it burns with a beautiful light green flame: the same delicate tinge is visible when a little of the oxide, or any of the salts of this metal, is ignited on burning coal. The green flame thus produced deposits a small portion of greenish-grey prevalent oxide, and hence it gradually collects as a kind of foot in the chimneys of furnaces employed in smelting this metal.

Copper soon rusts in a damp air, and becomes covered with a green crust of carbonated oxide, but this coating, by its fluid adhesion to the metal beneath, long preserves it from further alteration; hence it requires a length of time, and the concurrence of circumstances peculiarly unfavorable to preservation, in order to corrode entirely a thick plate of this
C O P P E R.

this metal. Water is not decomposed by copper even at a
white heat.

With the exception of a few cases, that will be mentioned
previously, copper appears to unite very uniformly with the
same proportion of oxygen, forming (when unconjugated
and with water and every other substance) a brownish-black oxyd,
of which one-fifth, or 20 per cent., is oxygen, and the remainder
copper. This oxyd is produced, as has been already men-
tioned, by boiling the precipitate from any of the cuprous
salts by an alkali, or the ammoxid of copper, with caustic
potash or soda.

Copper, or rather its oxyd, combines with every acid,
forming salts, many of which are both curious and im-
portant.

Sulphuric acid acts upon metallic copper only when con-
centrated and boiling hot. For this purpose take copper
flings, or thin sheet copper, put it into a glass vessel with
twice its weight of strong sulphuric acid, and heat the
mixture. As soon as it begins to boil, much sulphuric acid
gas is given out, and at length the whole diffuses into a
dark-coloured liquor, which, by dilution with water, becomes
a fine blue. If common copper is used for this purpose,
there always remains a black sediment, which consists for
the most part of sulphuric copper. If the pure cuprous
oxyds are employed, instead of the metal, they will be found
to be soluble even in cold and diluted sulphuric acid. The
solution, in whichever way it is formed, deposits, by evapo-
ration and gradual cooling, rhomboidal crystals of a deep
sky-blue colour, which are sulphat of copper, the blue or
Roman viriad of the shops.

The same salt is also met with native in copper mines,
partly crystallized, but more generally dissolved in the water
which drains more or less into all mines. When native, it
appears to be formed in consequence of the iron pyrites be-
ing first vitrified, and the resulting sulphat of iron re-acting
on the copper.

Sulphat of copper has a very strong, flyptic, somewhat
acridulous, and excessively nauseous taste. It is soluble in
about four times its weight of water. When dried at a
heat not exceeding that of boiling water, it looses, according
to Proust, about 36 per cent., which is mere water, after
which the residue, which is a white pulverulent mass, is again
soluble and crystallizable, as at first. But if it is calcined
with a strong white heat, the acid itself is expelled without
undergoing decomposition, and at length there only remains
black oxyd of copper, in the proportion of 32 per cent. of
the original crystallized salt. Hence 100 parts of sulphat
of copper, cold, according to Proust, of

\[
\begin{align*}
\text{Copper} & : 25.61 \\
\text{Oxygen} & : 6.43 \\
\text{Water} & : 32 \\
\text{Sulphuric acid} & : 32 \\
\text{Water} & : 36
\end{align*}
\]

\[
\frac{100}{14.5} = 100
\]

Bergmann's analysis of this salt nearly agrees with that of
Proust in the proportion of copper (26 per cent.); but of
the other ingredients he reckons 28 parts of water, and 46 of
acid.

Besides the common sulphat, Proust describes a sub-sulphat
of copper. This is prepared by adding to the common sul-
phat some caustic potash, but not sufficient entirely to de-
compose it. A green precipitate is in consequence deposited,
which is the sub-sulphat in question. This salt loses by
distillation only 14 per cent. of water. The residue, boiled

with caustic potash, gives 68 per cent. of black oxyd; hence
its component parts are

\[
\begin{align*}
\text{Copper} & : 54.41 \\
\text{Oxygen} & : 13.63 \\
\text{Sulphuric acid} & : 18 \\
\text{Water} & : 14
\end{align*}
\]

\[
\frac{100}{54.41} = 100
\]

Sulphat of copper is decomposed by the alkalies, whether
pure or carbonated. If either of the fixed alkalies in their
basic state is made use of, the precipitate is not, as might
be supposed, a simple oxyd of copper, but that peculiar com-
position first discovered by Proust, and named by him hydrat
of copper. It is thus prepared: to a cold solution of sul-
phat of copper add liquid potash, also cold, to complete
saturation; a blue precipitate falls down, which, when
thoroughly washed with boiling water, is the pure hydrat.
Its constitution, when dried at a heat not exceeding 21°
Fahr., is nearly that of Prussian-blue; at a somewhat higher
temperature it shrinks, and is gradually converted into black
oxyd, by the evaporation of its water. By dry distillation
it is found to give out about 24 per cent. of water, and 1 of
carbonic acid, which it probably has absorbed from the air
during its preparation, if this latter is again moistened with water, it does not
return to the state of hydrat. Hence it appears that the hydrat
is a true chemical combination of copper and water, and oxyd of copper,
in the proportion of about one part of the former to three of
the latter, and as such enters into the composition of the
cuprous salts. The hydrat is decomposable not merely by
heat, but also by boiling with either of the fixed alka-
lies.

Carbonic acid and oxyd of copper unite together without
difficulty. This combination is found native, forming
the mountain-blue, the malachite, and some of the other ores of
copper. It may be prepared artificially by exposing the
metal to a damp confined air, in which case it constitutes a
rust of copper; or more expeditiously by decomposing any
of the acid salts of copper by a carbonated alkali. A copious
bulky precipitate falls down, which, when well washed and
gently dried, is a fine powder of a bright pale apple-green
colour. One hundred parts of copper, dissolved in any acid,
and precipitated by carbonated potash or soda, produce in-
vitably 180 of the green carbonat, dried at a boiling-water
heat. This carbonat, when distilled by itself, with a heat
gradually increased to redness, gives out 10 parts of water,
and 46 of carbonic acid; the black oxyd, remaining behind
in the retort, amounts to 125 parts, of which 100 are
copper, and 25 oxygen.

When hydrat of copper is gently heated with a solution of
super-carbonatated potash, a portion is dissolved, forming a
greenish-blue liquor, whilst the undissolved residue becomes
almost as dark in colour as the black oxyd. The solution,
if slowly evaporated, yields a singular salt, consisting of 52
per cent. potash, 43 carbonic acid, and 5 oxyd of copper.
It is crystalizable and slightly deliquescent. A similar salt,
with a base of soda, is produced, when this latter alkali is
employed instead of potash.

Copper is very readily soluble in nitric acid, even when
cold and considerably diluted. Much heat is excited, and a
torrent of nitrous gas given out, the liquor becoming of
a bright blue colour in proportion as the copper is dissolved.
The oxyds of copper are equally soluble in this acid as
the metal is, but without the evolution of nitrous gas.
When this solution is hastily evaporated to a certain point,
COPPER.

and then suffered to cool, it congeals into a deep blue fialine mass, which deliquates rapidly when exposed to the air. By a slow and careful evaporation this salt may be obtained in the form of hexahedral prisms, but equally deliquescent as the former amorphous variety. If this blue nitrat be evaporated beyond the point at which it would crystallize when cold, nitrous gas begins to be produced, and a green scaly concretion separates from the thick blue liquor. If the evaporation is here stopped, this green matter may be separated by water, either hot or cold, which diffuses only the undecomposed blue nitrat. This green substance is considered by Proust as a subnitrat of copper; that it still contains nitric acid is proved by its still giving out this acid when mixed with sulphuric acid and heated. By thorough calculation all the acid and water are expelled, and the black oxide of copper only remains. The proportions of the subnitrat, according to the above-mentioned chemist, are:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black oxide of copper</td>
<td>67</td>
</tr>
<tr>
<td>Nitric acid</td>
<td>-</td>
</tr>
<tr>
<td>Water</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>100</td>
</tr>
</tbody>
</table>

The blue or perfect nitrat, on the other hand, contains only 27 per cent. of black oxide.

Nitrat of copper is very soluble in alcohol, to the flame of which it communicates a very delicate green colour.

The decomposition of this nitrat by tin is so violent as to exclude all cafes to produce actual combustion. This forms an amusing experiment, and was, we believe, first discovered by Dr. Higgins. It is thus performed: spread out a piece of tin-foil four or five inches square, lay in the middle a small heap of the black oxide nitrat, sprinkle the tin with a few drops of water, spread over it a little tow, then double up the tin-foil round it on all sides, twisting it as tight as may be without breaking. In a short time the mass will feel burning hot, small bubbles of blue liquor will be seen oozing through, and will presently be succeeded by a copious eruption of nitrous gas, attended by minute sparks of fire and deflagration.

A fine blue pigment is prepared from nitrated copper, called verditer (vendeur blues, Fr.) It is made in quantity by the refiners, who, after the process of separating silver from gold by aquafortis, recover the silver from its solution by means of copper, and thus obtain a residuum of nitrat of copper. This solution is decomposed by lime (the precise method of doing which is kept secret), and the produce being made into cakes and dried slowly constitutes the best kind of verditer.

This pigment has been analyzed by Pelletier with the following results. It was totally soluble in nitric and muriatic acids, with a copious effervescence of carbonic acid; when distilled by itself 600 hundred grains lost 200, and afforded 2 French pints of carbonic acid together with some water. The calcined residua was a black powder, which, being fused with a reducing flux, yielded a button of pure copper, amounting to about half the weight of the original verditer. A fresh part was then treated with fulphoric acid, which afforded sulphat of lime, the earth of which formed about 7 per cent. of the original verditer. Of the 200 grains lost by distillation, Pelletier considers 180 as carbonic acid. Hence 100 parts of verditer contain

<table>
<thead>
<tr>
<th>Substance</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>50</td>
</tr>
<tr>
<td>Carbonic acid</td>
<td>50</td>
</tr>
<tr>
<td>Water</td>
<td>3½</td>
</tr>
<tr>
<td>Lime</td>
<td>7</td>
</tr>
</tbody>
</table>

Remains for oxygen $9\frac{1}{2}$ 100

But in this estimate the amount of carbonic acid is by some oversight greatly overrated. The quantity obtained from 600 grains was about 2 French pints, the weight of which, according to Lavoisier, would be only 66 grains; consequently 100 grains would yield only 11 grains of this acid. The water was obviously only estimated at random, and as the copper was in the state of hydraz, certainly amounted to much more than Pelletier has allowed for it. The corrected results of the above analyses therefore would be:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Copper</td>
<td>50</td>
</tr>
<tr>
<td>Oxygen</td>
<td>83 3</td>
</tr>
<tr>
<td>Hydrat of copper</td>
<td></td>
</tr>
<tr>
<td>Hydrogen</td>
<td></td>
</tr>
<tr>
<td>Water</td>
<td>30 8</td>
</tr>
<tr>
<td>Lime</td>
<td>7</td>
</tr>
<tr>
<td>Carbonic acid</td>
<td>11</td>
</tr>
</tbody>
</table>

101 3

which corresponds very closely with the quantity analyzed.

The muriatic acid diffuses copper with difficulty except when concentrated and boiling, and then hydrogen gas is given out. The oxides, however, of this metal, and especially the green carbonat, are very readily soluble in this acid. The colour of muriat of copper when hot or highly concentrated is brown, but by dilution becomes a greenish-blue. By careful evaporation and cooling it crystallizes in lengthened rhomboids, and when halfly evaporated in feathery crystals. This salt is commonly deiquefcent, but when both the copper and acid are quite free from iron is permanent in the air. It is readily soluble both in water and alcohol; the latter takes up its own weight when boiling, a part of which afterwards separates in a crystalline flake as the liquor cools. The composition of the crystallized salt is, according to Proust:

<table>
<thead>
<tr>
<th>Substance</th>
<th>Proportion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black oxide of copper</td>
<td>40</td>
</tr>
<tr>
<td>Muriatic acid</td>
<td>24</td>
</tr>
<tr>
<td>Water</td>
<td>36</td>
</tr>
</tbody>
</table>

100

A dilute solution of muriated copper in water makes a kind of sympathetic ink, which is colourless in the cold, becomes yellow by warming, and again loses its colour on cooling. Besides the common muriat, the ingenious researches of Proust have discovered a second muriat, in which the copper appears to be at a lower state of oxidation than in the former salt. It affords a nearly colourless solution, and when solid is of a greyish white; it may therefore without impropriety be called the white muriat of copper. It is prepared from the common muriat by means of muriat of tin, a salt remarkable for the eagerness with which it absorbs oxygen from almost all the other metallic salts. If therefore some of this latter is poured into common muriat of copper, a precipitate falls down which is at first white, but by subsequent exposure to air passes through
through different shades of violet and blue to black. This precipitate is for the most part a muriated sub-oxide of copper. On exposure to a moderate heat it melts like luna cornea. If digested in warm muriatic acid it readily dissolves and is deposited on cooling, in the form of tetrahedral crystals. With nitrous acid some nitrous gas is given out, which shows that the metal was not previously saturated with oxygen. Another remarkable character of this white muriat is, that when diffused in ammonia the solution is colourless; though, on exposure to the air, it gradually acquires the sky-blue colour of common ammoniac of copper. Its composition, according to Proult, is

| Muriatic acid | 21.75 |
| Oxid of tin | 1.00 |
| Copper | 67.00 |
| Oxygen | 11.25 |
| Total | 100.00 |

Assuming this analysis as correct, it is obvious that the copper exists in a much lower state of oxygenation in this salt, than in any hitherto mentioned, for in this the oxid of copper is composed of 63 of metal and 11.25 of oxygen, or (reduced to the hundred) of 84.86 copper, and 15.16 oxygen, whereas the black copper, to which all the common cupreous salts are reducible by lots of their acid and water, consists of 80 per cent. copper, and 20 oxygen.

There appears to be yet another state of composition of muriatic acid and oxid of copper, also first noticed by Proult. It is the sub-muriat of copper, differing from the common muriat not by a lower degree of oxygenation in the metal, but in a smaller proportion of acid. It is produced by adding a little water (less than required for saturation) to the green muriat. A green powder falls down, which is the submuriat in question. This salt when boiled with potash loes about 28 per cent. of its weight, and is reduced to the black oxid. A similar submuriat is laid by the same chemist to be spontaneously deposited when copper is diffused in nitro-muriatic acid. The composition of this salt is as follows:

| Black oxid of copper | 79.00 |
| Muriatic acid | 12.50 |
| Water | 8.50 |
| Total | 100.00 |

The native green muriat of copper from Peru appears to be nearly in this state.

Copper seems to have a stronger affinity for muriatic acid than even for the nitric or sulphuric. Thus, if either the solid nitrat or sulphat of copper be digested in muriatic acid a solution takes place, and then, on the application of heat, the liquor immediately looses the blue colour, characteristic of these two salts, and acquires the green of the muriat: also by slow evaporation muriat of copper is obtained in crystals.

Acetous acid has no action on regular copper, but its oxid is easily soluble in this fluid, to which it communicates a beautiful grass-green colour. There are two species of acetic copper, the one with an excess of acid, the common verdigris of the shops, and the other in which the acid and oxid are in a state of mutual saturation, forming the crystallized or diffused verdigris.

The manufacture of verdigris is carried on to a considerable extent in most of the southern provinces of France, and a very exact account, apparently, of the process has been published by Chaptal, from which the following particulars are extracted.

The materials for this manufacture are the marc or cake that remains in the wine-press, after the greater part of the juice has been liquefied out; and plates of copper of convenient size and hammerd well, in order to smooth the surface, so that the corroded portion may be readily detached from the back.

The marc of the grape is first fermented by being laid as lightly as possible in a large barrel and moistened with common wine, and then set in a warm airy place. In a few days, varying according to the heat of the weather, it begins to flow; turns hot and exhales a brown colour of vinegar; the fermentation then declines and the marc is fit for use. A layer of this is then put into an earthen pot and a plate of copper, previously made scorching hot, is laid upon it; to this succeeds another layer of marc, and then a plate of copper, in regular alternation till the pot is filled, observing that both the top and bottom layers are of marc. The mouth of the pot is then loosely stopped with straw, and the whole is left at rest from ten to twenty days.

When the marc begins to whiten the pots are unpacked, and, if the process has gone on well, the copper-plates are found covered with a green crust, intermixed with fusty green crystals. The marc is thrown away; the plates are let on end on wooden racks in a cellar, and when dry are dipped in water and again set to dry; this is repeated once or twice, or eight times, which makes the crust of oxid swell and increase both in quantity and quality: after which it is scraped off by a knife without difficulty. Each pot yields about 5 or 6 lbs. of rough verdigris, and the plates will serve again repeatedly till they are corroded quite through.

This rough verdigris is further prepared for market by being ground in wooden mortars, and exposed to the air till it is sufficiently dry; and in so doing it loses about half its weight.

Verdigris thus prepared, may be considered as copper oxidated by the action of the acetic acid, and combined with water, with carbonic acid, and with part of the extractive or mucilaginous part of the marc. It is nearly insoluble in water and its colour is blueish green. If this verdigris is digested in distilled vinegar it diffuses readily in this fluid, and by evaporation and cooling a crystallized salt of a deep green colour may be obtained, which is known in the shops by the name of distilled verdigris. The method in which this valuable salt is prepared at Montpellier is as follows: Common vineger is first distilled in a copper alembic, and the acid thus produced is put with common verdigris into a copper boiler; when a hot saturated solution is thus made, it is strained and transferred to another copper evaporating vessel, where it is boiled down till a brown crust begins to collect on its surface; a light frame of crofts falls is now sunk into the liquor and the fire is put out. On cooling, the acetate of copper crusts round the flasks in clusters of rhomboidal crystals of a deep blue-green colour. It requires about 3 lbs. of verdigris to make 1 lb. of the crystallized acetic.

The composition of common verdigris is subject (as might be expected from the method in which it is prepared) to a considerable variation, and this difference is still further increased by variations in the way of manufacturing this salt. Thus, at Grenoble, verdigris is made merely by dipping plates of copper in a proper room, and moistening their surfaces.
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Copper is a highly valuable metal, used in various industries due to its unique properties. The extraction and refinement processes are crucial in obtaining pure copper. Historically, copper has been extracted using methods that involve the use of heat and chemical reactions. The natural combinations of copper with arsenic and arsenic acid are well-documented, with Scheele's green being a famous example. The elucidation of these processes is essential for both historical and practical contexts.


To the above particulars may be added some observations, by Proult, on the properties and composition of this falt.

When common verdigris is put into cold water, it gradually falls to pieces and nearly half of it is diffused, the remainder is a fine green powder which diffuses itself through the liquid and subdides very slowly. This green powder appears to be pure subacetite of copper, and when washed and dried weighs about 42 per cent. of the original verdigris. When sulphuric acid is poured on it, pungent vapours of vinegar are given out. Boiled with potash it affords 63 per cent. of black oxyd; and when diffused, after all the volatile products have passed over, there remains about 52 per cent. of copper, principally in the metallic state. From these data therefore the subacetite appears to consist of:

- Copper: 59.4%
- Oxygen: 12.0%
- Remaining for acid and water: 37%

With regard to the crystallized acetite, Proult found that 39 parts of black oxyd produce, with diffilled vinegar, 100 parts of acetite, and on the other hand, that 100 parts of this falt, when decomposed by boiling with potash, yield 39 or 40 parts of black oxyd. Hence it is composed of:

- Copper: 31.2%
- Oxygen: 7.8%
- Acetous acid: 61%

The diffiluation of the crystallized acetite furnishes the most pungent acidetic, or radical copper, as has been already described under Aceturus Acid. Acetite of copper, besides being made by direct combination of its ingredients, may be prepared in various ways by double affinity; of thefeth the belt upon the whole is the following: Make a cold solution of sugar of lead (acetite of lead) in distilled water, to which add, by degrees, a cold solution of blue vitriol (fulphat of copper), as long as any precipitation takes place; then pour the whole on a filter, and a green liquor passes through, the fulphat of lead remaining on the filter, in the form of a white powder. The green liquor, being concentraded by evaporation, deposits, by cooling, very pure and beautiful crystals of acetite of copper.

The natural combinations of copper with arsenic and arsentic acid have already been noticed. With regard to the artificial arsentic, Scheele discovered that when arsenic acid is diffused with copper filings, a green solution is formed, and a blue powder, which is also an arsentic, is precipitated. The fulphat, nitrat, and muriat of copper undergo no apparent change, when added to arsenic acid; but the acetite is decomposed, and arsentic of copper is precipitated. All the cuprous salts, however, are decomposed by arsentic alkali, and a blue arsentic falls down. To these facts Mr. Chenevix has added the following: If arsentic of ammonium and nitrat of copper are added, there falls down a blue crystalline arsentic of copper. On evaporating the supernatant liquid, and adding alcohol, another copious deposition of crystals took place, of a deeper colour than the former, and of a rhomboidal shape. Each of these arsenites was examined separately, first by calculation at a low red heat to expel the water, then by potash for the black oxyd of copper, and lastly by nitrat of lead for the arsentic acid. By this method, the first arsentic was found to consist of:

- Oxyd of copper: 50%
- Arsentic acid: 27%
- Water: 23%

= 99%

The second arsentic afforded:

- Oxyd of copper: 35%
- Arsentic acid: 39.5%
- Water: 24%

= 98.5%

Arsenite, in the state of white oxyd, combines with oxyd of copper into a pale green powder, called, from its discoverer, Scheele's green. It is prepared in the following manner: Dissolve 24 ounces of sulphat of copper in water, and heat the solution in a copper vessel; also boil in another vessel 24 ounces of pearlash, 11 ounces of white arsenic, and about 3 pints of water; when the whole is dissolved, strain each solution separately through linen, and then add the arsenticated potash, little by little, to the sulphat of copper, with constant stirring; an effervescence will take place, and then a green powder will be deposited. When the mixture is mixed, let it stand some hours, then separate the precipitate by the filter, edulcorate it well with clear hot water, and dry it very gently in a warm room. The above quantity of ingredients will afford about 1½ ounces of the powder, which may be used as a pigment.

Phosphat of copper may be prepared by adding phosphat of soda to the nitrat, or any other readily soluble falt of copper, a blueish-green sediment falls to the bottom, which dries to a powdery semi-crystalline mass. A low red heat turns it brown, and drives off about 15.5 per cent. of water: there remains a phosphat of copper, composed of 35 parts of phosphoric acid, and 49.5 of oxyd of copper.

A skirking decomposition of nitrat of copper also takes place, when a thick of fresh melted phosphorus is immersed in a solution of this falt, and exposed to the light. By degrees the copper is precipitated on the surface of the phosphorus, in the metallic falt, and in the form of crystalline grains.

All the fals of copper are decomposed by the alkaline proflatas, and the retart is a sediment of a reddish-brown colour, which, by drying and exposure to the air, acquires a dark
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dark chocolate hue. This prussian of copper mixed well with oil, and has been employed with force success as a pigment.

The solution or infusion of galls throws down from all copperous solution a precipitate of a dirty yellow colour.

Oxide of copper is soluble in all the other acids, forming with them, however, salts little known, and of little importance: the predominating colour in all of them is green.

The alkali, neither potash nor soda have any action on copper or its oxides, except that already mentioned, of taking away from the hydrat its water of combination, and reducing it to black oxide.

Ammonia has no action on metallic copper, but diffuses its oxides without difficulty. The usual colour of this solution is a deep blue-purple. The most direct method of preparing it is by digerizing together liquid ammonia and any oxide, or carbonated oxide of copper: the liquor becomes blue almost immediately, and its colour deepens till saturation takes place. By flow and careful evaporation, blue silky crystals of ammonium of copper may be procured. This salt, by exposure to the air, gradually loses its alkali, and absorbs carbonic acid, so that at length it is wholly converted into green carbonate. The aqua funginita of pharmacy and surgery consists, for the most part, of ammoniated copper, to which its colour is owing: it is made chiefly in two ways. The first is to digest in a glass vessel quick-lime, muriat of ammonia, verdigris, and water; the lime decomposes the muriat of ammonia, disengaging the alkali, which, in its turn, decomposes the verdigris, and dissolves the oxide of copper; hence the clear liquor consists of ammoniated copper and muriat of lime. The second method, where a weaker solution is wanted, is to employ lime-water instead of lime. Another way of producing ammoniated copper immediately is to superinate with this acid any of the salts of copper, in consequence of which the first portions of alkali decompose the cuprous salt, throwing down an oxide, and the succeeding portions redissolve the oxide, forming a dark-blue solution. As there is no other metal besides copper and nickel which produces this particular colour, and as the latter of these metals is not common, the production of this beautiful tinge, by the addition of ammonia, may be considered as a very probable indication of the presence of copper.

A singular circumstance takes place with regard to ammoniated copper. If a bottle be filled with liquid ammonia, and a few clean copper filings be added, no solution ensues, as long as the bottle is kept close corked. But if the bottle be opened for a while, and then shut again, a solution indeed of part of the copper takes place, but without any change of colour in the liquor: but when the bottle is again opened, the characteristic blue tinge appears first at the surface of the solution, and gradually spreads down to the bottom. If now a few more copper filings be added, and the bottle again corked, the solution will in a short time again become colourless, and continue so till it is again exposed to the air. The reason of these changes appears to be the following: copper requires some, but only a very small quantity, of oxygen to be soluble in ammonia; and when in this lowell state of oxydation, it forms with ammonia a colourless solution, as it forms with muriatic acid a white sub-muriat: but if this solution is exposed to the air, the metal absorbs oxygen, and is thus brought to that state in which it tinges ammonia blue; being again shut up with a few copper filings, the oxygen is partly absorbed by the recently added metal, and reduces the whole to the state of white oxyd.

Many of the neutral salts, especially the muriats, are capable of oxydation, and, in part, of dissolving copper: this is especially the case with muriat of ammonia, which, when made into a mass with copper filings and a little water, and kept warm, perfectly converts the copper into a green muriated oxyd.

Copper and sulphur readily unite. If equal parts of copper filings and flowers of sulphur are mixed and heated in a crucible, much of the sulphur burns off; but the remainder melts into a blue-black mass, which is sulphuret of copper.

According to Priest, 100 parts of copper take up in this way 28 of sulphur, so that the sulphuret is composed of about 79 of metallic copper, and 21 of sulphur. No oxygen appears to be present. This substance is more fusible than copper, melting readily at a red heat. By roasting in the open air, the sulphur is expelled: the last portions, however, adhere with great obstinacy. According to Dr. Thomson, sulphur and copper filings unite together, by being merely mixed together with or without water, and exposed for a long time to the air.

Hydrosulphurated water, or any of the liquid hydrosulphuric acids, when added to the solutions of copper, produce a deep blue-black precipitate, which is a hydrosulphuret of copper.

Phosphorus is capable of intimate combination with copper. If 5 parts of this metal in filings, 8 of vitreous phosphoric acid, and 1 of charcoal powder, are intimately mixed together, and then put into a crucible, and exposed to an intense heat, the phosphoric acid is decomposed by the action of the charcoal, and the phosphorus in part burns off, and in part unites with the copper, forming a hard, field-grey, brittle article, capable of a high polish. A simpler way of preparing the same is to make copper filings red hot in a crucible, and project upon them small pieces of phosphorus, which combines with the metal, and melts down into a grey mass, similar to the former. One hundred parts of copper may thus be increased to about 125; but if this phosphuret is kept for some time melted under charcoal powder, or melted gla$; part of the phosphorus burns off. When this excess is thus got rid of, the ingredients of the remaining phosphuret appear to be in a state of mutual saturation, no more phosphorus being dissipated by a continuation of the fusion. In this state the mass appears to consist of 92.1 of copper, and 7.7 of phosphorus: it retains the grain and colour of steel, is susceptible of a high polish, and does not readily tarnish in the air, but is brittle. With a slight less proportion of phosphorus, it becomes malleable, and of a yellowish-white colour. Phosphuret of copper, if kept in fusion, with free exposure to the air, loses gradually most of its phosphorus, which burns away with the bright flame and colour peculiar to this substance.

The mixed oils, when kept long in contact with copper, oxide it, and dissolve a portion, by which they acquire a green colour.

The utes of copper, in its various states, are so numerous and important, as to be scarcely inferior to those of iron. All the salts of copper are more or less poisonous, producing violent nausea, with severe pain and inflammation of the intestinal canal. Yet from the sudden vomiting that they excite, a large dose may be given with safety; and this is sometimes done, when there is an immediate necessity of emptying the stomach.

Copper, however, is very little used medicinally in any form.

§ 5. Alloys of Copper.

The alloys of copper are, upon the whole, of more importance than those of any other metal: we shall, therefore, treat of them with some minuteness.
Copper, when added in small quantity to either of these metals, greatly increases their hardness, without materially debating their colour or malleability: hence it has been generally adopted as the alloy for that portion of the precious metals which is employed with current coin, and for plate.

Copper with arsenic.

On account of the volatility of arsenic some precautions are required in the preparation of this alloy. The best way, upon the whole, is to melt some copper in rather a large crucible, and then to wrap up in paper some reglumine arsenic, or white arsenic, either with or without a mixture of charcoal powder. and to immerse the paper, with its contents, in the melted copper, either by means of a pair of long tongues, or by ramming the paper into a small crucible, and then inverting the crucible in the fluid metal. The arsenic preferably rises through the copper in dense white fumes, and is in a great part deliquescent; a portion however is retained by the copper, and by repeating the process once or twice more, the alloy will be fully saturated with arsenic.

This alloy is of a silvery white colour and a close texture; it is however very brittle, and, in proportion to the perfect whiteness of its colour, liable to tarnish in the air. As soon as it is brought to fusion the arsenic begins to escape, and the copper regains its malleability: the last portions however of arsenic are not driven off even by long continued heat, and although the copper regains its malleability, its colour remains of a dingy yellow.

Vauquelin has discovered that if to an alloy of copper and silver, in equal proportions (the colour of which is a pale yellow), there be added 2 per cent. of arsenic, the result is a perfectly white ductile and malleable alloy. If this latter ingredient exceeds 5 per cent. the alloy begins to be brittle.

Copper with iron.

These two metals only unite when the former of them is greatly in excess. The result is a hard, grey, and somewhat brittle alloy. According to Mr. Keir, the tutenag of the Chinefe is a white alloy of copper, zinc, and iron; it is hard, tough, and sufficiently malleable to be wrought into candlesticks and various other articles of domestic furniture, which take a high polish, and are scarcely to be distinguished from silver. The inferior sort of tutenag has, however, a very perceptible brassy tinge.

According to D'Azé, the alloy of iron and copper only ceases to be acted on by the magnet, when the proportion of the former is less than \( \frac{3}{5} \) of the whole mass. Iron is much inferior in its power of whitening copper to tin or even to arsenic.

Copper with lead.

These metals unite, to appearance, very intimately by fusion; but when a mass of this alloy is exposed to a very low heat, the greater part of the lead, with a small portion of copper, sweats out, leaving the rest in a porous honeycombed state. When the copper holds a little silver, the lead carries the latter out with it: this process is called eliquation, and will be treated of more at large in the article Silver. Copper, with about a fourth of its weight of lead, forms an alloy of a deep red; this alloy is called pot-metal. The Roman pot metal was composed, according to Pliny, of 100 parts copper, 2 lead, and 2 tin. The same ingredients, but with larger proportions of the two latter, were the materials of many of the ancient Greek and Sicilian coins, as appears from analyses of them by Klaproth.

Copper with zinc.

Copper, when nearly saturated with zinc, that is, when the latter amounts to about one-fourth of the alloy, forms brass, of which an account has been already given. With a smaller proportion of zinc, the colour of the alloy approaches more nearly to that of gold, and its malleability increaseth. Mixtures, chiefly of these two metals, are employed to form a variety of gold-coloured alloys, known by the names of tombac, Monbein or Dutch gold, tinsel, similor, prince Rupert's metal, pinchbeck, &c., the precise composition of which varies according to the fancy or experience of different artists. The Dutch gold may be beaten into extremely fine leaves, which when fresh are a cheap and good imitation of gold leaf; but they tarnish very soon. The mixture may be made either by melting together copper and zinc, or copper and brass. In either case the copper should be melted first, and the other ingredient added afterwards: being then carefully stirred together with a flick, the alloy is to be poured out into proper moulds without loss of time, left the zinc should burn off.

A fine malleable tombac may be made with 16 parts of copper, one of zinc; and one of tin; if a larger proportion of this latter is added, the alloy becomes harder and brittle. Several Roman coins struck, during the first century of the emperors, have been analyzed by Klaproth, and appear to consist of nearly pure copper, others of copper, with from a fifth to a sixth of zinc. A little tin and lead were found in some, but in such small proportions as to appear only an accidental impurity.

Copper with tin.

The alloy of copper and tin are extremely important in the arts, and curious as chemical mixtures. Tin added to copper makes it more fusible, liable to rust or be corroded by the air and other common substances, harder, denser, and more fonorous. In these respects the alloy has a real advantage over unmixed copper; but this is in many cases more than counterbalanced by the great brittleness of the mixture which even a moderate portion of tin imparts, and which is a singular circumstance, considering how very malleable both metals are before mixture.

The feasible qualities of the different mixtures of these two metals are the following: Copper, alloyed with from one to five per cent. of tin, is much harder than before; its colour is yellow, with a cast of red, and its fracture is granular: it is still considerably malleable. This appears to be the usual composition of many of the ancient edged tools and weapons before the ufe of iron; whence it appears that the ancients did not possess (as has often been supposed) any peculiar art of hardening pure copper, otherwise than by mixture. An alloy in which the tin is from \( \frac{1}{5} \) to \( \frac{1}{2} \) of the whole is hard, brittle; but still a little malleable, closely-grained, and yellowish white. When the tin is as much as \( \frac{1}{3} \) of the mass, it is entirely brittle, and continues so in every higher proportion. The yellowness of the alloy is not entirely lost till the tin amounts to \( \frac{1}{2} \) of the whole.

Copper (or sometimes copper with a little zinc) alloyed with as much tin as will make from about \( \frac{1}{3} \) to \( \frac{1}{2} \) of the whole, forms an alloy which is principally employed for bells, brass cannon (so called), bronze statues, and various other purposes. Hence it is called brosses or bell-metal, and is excellently fitted for the use to which it is applied by its hardness, density, and fusibility. For cannon a lower proportion of tin is commonly used. According to Dr. Watson, the metal employed at Woolwich consists of 100 parts of copper, and from 8 to 12 of tin; hence it retains some little malleability, and therefore is tougher than it would be with a larger portion of tin. A common alloy for bell-metal is 80 of copper and 20 of tin: some artists add to these ingredients zinc, antimony, and silver, in the proportion of 

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Small proportions, all of which certainly improve the fonorous offsets of the compound.

When in an alloy of copper and tin, the latter metal amounts to about 1/3 of the mass, the result is a beautifully white alloy, with a lustre almost equal to that of mercury; extremely hard, very close-grained, and perfectly brittle. It takes an exquisite polish, which well adapts it for the reflection of light for all optical purposes. It is called speculum metal, and, besides the above ingredients, generally contains a little arsenic, zinc, or silver. The application of an alloy, similar to the above, to the construction of mirrors, is of great antiquity, being mentioned by Pliny. From the actual analysis, by Klaproth, of a portion of an ancient speculum, it appeared to consist of:

| Copper | 62 |
| Tin   | 32 |
| Lead  | 8  |

Of these ingredients the last is considered by Klaproth, with high probability, as only a casual adulteration of the tin.

When the amount of the tin exceeds that of the copper, the alloy begins to lose its splendid whiteness, and acquires a bluish-grey hue; its texture likewise becomes rough-grained, and, as it were, rotten and incapable of receiving a polish.

A perfect speculum metal should be quite white, without flowing any cast of yellow when polished, not very liable to tarnish, quite free from pores, even when examined by a lens, of a certain coherence or toughness to bear the grinder, and, for the convenience of working, as soft as may be consistent with the other requisites.

Mr. Mudge, whole specula were celebrated for their goodneifs, observes, that the extreme of whiteness is given by 32 parts of copper and 16 of tin, but this compound is too hard and brittle; 32 parts of copper with 14 2/3 of tin form an alloy quite white, and as hard as can be wrought. In order that the metal should turn out free from pores, it ought to be twice fused, once for mixture of the ingredients, and afterwards, with as little heat as possible, for casting.

The following observations on the same subject are extracted from an elaborate paper by Mr. Edwards, published in the Nautical Almanack for 1787.

The quality of the copper should first be tried by adding successively from 1/16 short of half of its weight of tin, that the mixture proves a little yellow, to the full half of tin, and by comparison of the various samples ascertaining the maximum of whiteness. When this is found, take 32 parts of copper, melt it, then add one part of brass and the same of silver, with a little black flux to cover the surface; when these are melted stir them together with a wooden rod, and pour in from 1 1/2 to 1 5/10 parts of tin (as ascertained by previous experiment) fud in a separate crucible, at a low heat; then stir the mixture again, and immediately pour it into cold water. Re-melt, with as little heat as possible, the alloy thus formed, and for every 16 parts take one of white arsenic, wrap it in paper, thrust the packet to the bottom of the fluid metal with a wooden rod, and stir it well as long as any arterial vapours arise; when these cease pour the metal into a mould of sand, and as soon as it has solidified lay it in a pot full of very hot embers, and cool it very slowly; unless this precaution is particularly observed, the metal will fly in pieces when cold, or will split in the polishing.

The brafs, the silver, and the arsenic in this composition appear to have their distinct use; the brafs makes the mixture tougher, and somewhat foth from, the silver improves its colour, and the arsenic renders the texture remarkably finer, closer, and less porous; a larger proportion of this however would make the metal inable to tarnish.

Sir J. Newton's specula were composed of 6 parts of copper, 2 tin, and 1 arsenic; they are upon the whole very good; but after being polished exhibit a rather yellow cast.

The other alloys of copper are not of much importance, and will be found under the respective metals to which they belong.

COPPER white, a kind of metal white as silver, frequently brought from China, and supposed by many to be natural. But it is only an alloy of copper, zinc, and arsenic, in certain proportions. It is made with difficulty, because of the volatility of the two metals; and, as its quality is noxious, it is not much used.

Copper, in Military Affairs. No other metal is allowed in magazines, or for barrels of gun-powder.

Copper, in Calico-Printing, a veal which the operations of dyeing, mordanting, &c. are performed, and which derives its name from the material it is generally contrasted of. As these veals are used indifferently for any of the above purposes, their size, form, and arrange-ment, are generally the same, and vary little throughout the whole kingdom. They are always circular, from 4 1/2 to 5 feet diameter at the top; 2 to 4 feet deep, and about the whole in width, across the bottom, which is the thickest and flowered part of the vessel. This circular form, though in general use, is perhaps the word that could have been devised for the purpose of calico-printing. It is no doubt the first that was employed, and has advantages in point of solidity of form, and ease of transportation from one place to another, over any other. For the purpose of dyeing, however, or any operations where goods are kept for a long time at a boiling heat, and turned over the winch, it is the most inconvenient that could have been adopted.

In a veal of this size, and form, it is customary to dye from six to twelve pieces of twenty-eight yards each, at one operation. The goods are diposed either in two lengths of four or fix over the winch; or, when quick turning is necessary, in one length only, in which case, fix pieces, or at most eight, are diposed equally over the whole surface of the winch. In this latter case, the inconvenience of the circular form is particularly felt. It is evident that when six or more pieces are crowded upon a winch, those which are at the extremities will have little or no space in which to float, without disturbing those which are nearer the centre; whilst, on the other hand, those which are in the middle will have more than sufficient, and will float in the copper, scarcely ever touching its sides. In consequence of this, the pieces at the extremities of the winch, being crowded, will press along the sides of the copper, and thus be exposed to greater heat and hazard of copper-marking, than those which are in the middle. Their disposition on the winch will also be deranged, and the copper-man, with all his care and attention, will be unable to preserve that order and regularity in the distribution of their folds, so efficaciously re- quire in good dyeing. When the copper is in a state of ebullition, these evils increase, and it rarely happens that the most experienced dyer can keep his goods diposed in such manner as prevent their getting completely salted, when he has two lengths of fix over the winch, and keeps them twenty or thirty minutes at an actual boil. By
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By adopting a square, or, what is still better, an oblong vessel of the same capacity as the former, these inconveniences are in a great measure done away; the goods have all equal space to float in, are equally removed from the centre and sides of the vessel, and preserve their order and disposition on the winch, even in a state of ebullition, with ease, certainty, and comparatively trifling attention.

Dyecoppers are generally set up in brick work, with each their separate and direct fire-place, chimney, &c.

The same principles apply to the heating of these vessels as to all other boilers, but we need not enter here upon a subject which will be more fully treated of in another part of this work. The recent improvements in the application of steam, as a vehicle of heat, are however of such importance, and have at this moment excited such general interest amongst dyers, and calico-printers, as to claim a short notice in this place.

Mr. Gott, of Leeds, was the first who applied steam in the large way, to the heating of dyecoppers, and the success of his experiment was so complete, as to induce many others to follow his example. This mode, which is the simplest and most economical that can be employed, consists in throwing the steam directly into the dyeing vessel. One steam boiler, situated at the extremity of the building, supplies his numerous copper-tubes which are disposed promiscuously about the dye-houset, unincumbered with fire-places, altars, chimneys, &c. and simply surrounded with a casing of brick, to support the copper, and confine the heat.

The steam is conveyed in horizontal pipes, carried along the ceiling of the dye-houset, from which descend vertical tubes of from 3 to 3½ inches diameter, according to the size of the copper they belong to. These steam-tubes all pass down on the outside of their copper, and enter them horizontally at the level of their bottoms; and are furnished with brass cocks for regulating the admission of the steam, or entirely interrupting it when the copper is not wanted.

The rapidity with which these coppers are heated, is truly astonishing. One of the largest in Mr. Gott's dye-houset of 1800 gallons capacity, according to count Rumford, was brought to the boiling point in half an hour. The saving of fuel, though in general overrated, is another advantage gained by this mode of applying heat. Mr. Gott rates this at two-thirds of the quantity consumed when the coppers are heated by separate fire-places; but this is evidently too much. The saving consists in the application of fire to one vessel only of large dimensions, instead of to a number of small ones; and though this is certainly accomplished with less expense of fuel, yet, if the fire has been well and properly applied in the latter case, the saving will amount nearer to one-third than to two.

The burning of the copper sides and bottoms, when heated by a naked fire, is a heavy expense in a large establishment, and often a source of serious inconvenience. By the application of steam, this is entirely done away, and even copper vessels themselves, for many operations, rendered wholly unnecessary. Wooden vessels have been substituted, with great advantage, in their stead, and when the use of copper cannot be dispensed with, it may be employed in thin sheets, supported by a frame work of brick or wood. Important as these advantages are in an economical point of view, the system of steam-heating has, if possible, filled more powerful recommendations. The cafe, elegance, and regularity, with which the heat can be transmitted by a steam tube, are of themselves sufficient to entitle it to decided preference.

By the adjustment of the steam-cock, the rate of heating is so regulated, that the copper may be brought to the boiling point in any given time, with an exactness as well as certainty, unattainable by the other mode. The heat may in an instant be withdrawn, or rendered stationary at any fixed point, by a single turn of the cock, the effect of which is impracticable, and the latter extremely difficult, when the coppers are heated by separate fire-places. The sides and bottom of a dyecopper, exposed to a strong and naked fire, are always much hotter than the dye-liquor, and occasion copper-marks and unevenness in the goods, in some cases difficult to avoid. This inconvenience is entirely removed by the use of steam, since the dye-vehicle deriving all its heat from the heated liquor within it, can never, it is evident, acquire a higher temperature.

The success of Mr. Gott's experiments was such that many of his neighbours, at first much prejudiced against it, immediately adopted the plan. With a liberality worthy of imitation, his dye-houset was open to all inquirers; and thus was the interest excited by this new and extraordinary mode of applying heat, that experiments were immediately instituted in different parts of the country, with a view of extending this improvement to other branches of the art of dyeing. Mr. Gott had proved and established the practice as far as the dyeing of woollen goods was concerned, and little more remained to be done; in its application to calico-printing and the dyeing of lighter goods, however, difficulties occurred, of such a nature, as wholly to discourage many whole trials were made in a hasty ill-considered manner, and considerably to embarrass those whole experiments were conducted with greater skill and patience.

The great, and only well-founded, objection arose from the agitation which the water was thrown when it approached the boiling point, by which the goods were entangled and fattened, much more than in the ordinary mode. This inconvenience was not felt in Mr. Gott's dye-houset, where the goods being woolen, and of much greater weight and fulness, were less liable to be tossed about by the ascending currents from the steam-tubes than the thin and lighter goods manufactured from cotton. The evil was often increased by want of sufficient attention to the regulation of the steam-cock; thrice the quantity of steam necessary to maintain the copper at the boiling point being admitted, which, retaining its elastic form at that temperature, passed through the copper uncondensed, and threw the goods into the greatest confusion.

To diminish the agitation, it has been found necessary to break the force of the current, by introducing the steam in small quantities, through two or perhaps three different openings, or in some cases by introducing a false bottom, pierced full of holes, between the goods and the end of the steam-tube; by this means, and still more by carefully admitting only the necessary quantity of steam, the agitation may be so far reduced, as to be no longer troublesome.

The accumulation of condensed water in the dye-copper, is a necessary consequence of this mode of applying steam, and cannot be avoided. Where it is an object to diminish this as much as possible, it may be accomplished by using strong, or which is the same thing, very hot steam; but it does not appear that any great inconvenience results from this trifling increase, which escapes when the copper has attained the boiling point, due allowance being made for it in the first instance, when the vessel is filled with cold water.

When strong steam is rapidly thrown into a vessel filled with
with cold water, the condensation is instantaneous, and attended with a loud noise, and violent shock.

We have seen a flume of dimensions, and firm junctions, nearly shaken to pieces by the incalculable expansion of steam, and many of the early experimenters complained that their coppers were nearly knocked to pieces, and that few would hold water after being heated once or twice.

This inconvenience may be corrected by stopping the end of the steam tube, and piercing the sides full of small holes, or, which is still better, by turning up the end of the pipe, and fixing a valve in it. In either case the steam is emitted through the openings in the steamlets, or jets of small volume, whose condensation is attended with trifling noise, and little agitation of the vessel. Several dye-houses in Lancashire and Cheshire have been fitted up on these principles, and, the coppers, thus heated, are used, with few exceptions, for every purpose of calico-printing.

Mr. Gott, as we have before stated, was the first who introduced this improvement on a large scale, the idea of which, count Rumford informs us, was derived from the peculiar process of his seventh Essay. We know not what share the count's publication might have in deciding the trial, but the idea of heating water by steam had occurred long before that time to Mr. Watt; and, if we mistake not, a warm bath at Soho had been heated in this way, and seen by Mr. Gott, and many others, to whom the idea of its application to more useful purposes had naturally occurred.

For some few purposes we believe this mode of applying heat, by throwing steam directly into the dye-copper, is less advantageous. When goods, for example, are kept a long time at a low heat and never boiled, the accumulation of condensed water, in this case, continues to the end of the operation, and weakens considerably the effect of the dye. All the advantages of this mode may, however, be obtained without any of the inconveniences we have before alluded to, by surrounding the dyeing-vessel with a casing of cast iron, and throwing the steam in between this and the copper. The heat in this case is transmitted through the sides of the copper, as in the ordinary mode of heating by a naked fire, and the condensed water is carried off from the casing either by a reversed syphon, eight or nine feet long, or, when the situation will not admit of this, by a floating valve. In this way the noise and shock, from the rapid condensation of steam in cold water, the agitation in the dye-copper, and the condensed water, are all completely got rid of. The apparatus is, however, less simple and much more expensive than the former.

A strong steam is necessary to produce the boiling heat in a dye copper cooled by the continued exposure of the goods on the winch, and the vessel and joints must be found and strong to support this pressure. Both modes have their advantages, and will, we have little doubt, in a few years entirely supercede the ordinary mode of heating by separate fire places.

Copper mark is a stain, discoloration, and unevenness in dyed goods, caused by contact with the sides of a hot or dirty copper, during the operation of dyeing. In the ordinary mode of heating, as has been observed in the foregoing article, the bottom and sides of a dyeing-vessel, when exposed to a strong and naked fire, are much hotter than the dye liquor. When this is the case, and the colours pale and delicate, simple contact with the hot copper is sufficient to cause unevenness, either by affecting the hue by the excess of heat, or enabling the mordant to combine with an extra portion of colouring matter. This inconvenience is in general remedied by placing a basket of wicker work within the copper, which prevents the goods from touching the sides of the vessel; it is still more completely guarded against by heating the copper with steam, in the manner already described.

The sides of a copper will often occasion marks or flaws when the vessel has been negligently washed out, and especially when it has not been used for some time. A dye-copper not in use should always remain filled with clean water. It prevents the formation of a rust on its surface, which simple washing will not remove, and which acts as a mordant, and fixes the dye whenever it touches the cloth.

Copper Island, in Geography, otherwise called Mednoi Okrug, i.e. Mednoi Island, lies in the sea of Kamtschaks, which separates the two continents of Asia and America. It takes its name from large masses of native copper found upon the beach; and as it lies full in sight of Beering's life, it was early and speedily discovered by those who succeeded Beering. These two uninhabited spots, to which the sea-otters and other marine animals were accustomed to resort in great numbers, and which were first visited in 1745, were for some time the only islands that were known, until a scarcey of land and sea-animals, whose numbers were greatly diminished by the Russian hunters, occasioned other expeditions. Besides the native copper which is found on the coast of this island, the true right campfire-wood, and another sort of wood, very white, soft, and sweet-scented, are found among the floating bodies which the sea calls upon the shore. The copper lies on the shore in such abundance, that many ships might be laden with it; and an Indian trader might make a profitable voyage from thence to China, where this metal is in high demand. This copper is mostly in a metallic or malleable state, and many pieces of it seem as if they had been formerly in fusion. This island is not high, but has many hillocks, each of which has the appearance of having formerly been the funnel of a volcano. This island, as well as the others in its vicinity, are subject to frequent and violent earthquakes, and abound in sulphur. (Coxe's Russian Discoveries.) From the account in Captain Cook's Third Voyage (vol. iii. p. 347,) we learn, that, on Mednoi and Beering's island, scarcely a sea-ottter is now to be found; though it appears from Muller, that in his time they were exceedingly plentiful.

Copper Plates for Engraving. We are favoured with the following account of the method of preparing copper-plates, as practised at present in London, by Mr. Harris, form-in-law and successor to Mr. Whittow of Shoe-lane.

A sheet of copper must be chosen as free as possible from flaws, and of a somewhat greater thickness than the finished plate is intended to be: it is then to be scraped all over with a file, in shape something like the head of a spear, and fixed in a handle long enough to go under the arm, the other hand holding the tool near the cutting part. When this has been perfectly freed from the outward crust, scales, or rust, it must be carefully examined to see if there are any holes or flaws in it; if there are (which is almost always the case), they must be scooped out by a tool called a scoop, or scoop. This being done, it is next to be well and regularly hammered all over on an anvil, of a considerable degree of convexity, in order to harden it; and afterwards on a broad and nearly flat anvil, to flatten and planish it. After this has been performed, it is to be cut to the size wanted, and the edges a little chamfered or bevelled, and is now to be floured, that is, rubbed all over with a fine cutting, but not very coarse, grit flour, care being taken to use a great quantity of water, to float off the particles mutually abraded from the copper and flone. When it is judged that all the marks of the scoop and
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are rubbed out, a stone of a fine grit is to be used in the same manner; and after this a third.

The two flint-mentioned stones are found at the ironmongers in London, under the name of "Carpenters’ stone"; the best kind are brought principally from the coal fields in the neighbourhood of Bilston in Staffordshire. The flint used is called "Water of Aye stone," and brought from Dumfriesshire. All the three kinds contain a considerable quantity of argill in their composition. Lastly, a fine grained argillaceous grit, brought from the neighbourhood of Sheffield, has been used instead of the Bilston flint.

After the operation of flinting has been performed, the plate is to be "polished." This is done by rubbing it first with charcoal of birch-wood, or elder, and water, and then with charcoal of willow; the latter gives the finer polish, particularly if oil instead of water be used. Sometimes the plates are finished by burnishing, but this is not now often done.

The charcoal is not prepared by the copper-plate makers, but is procured from the dealers in that article by the workmen, who take a plate of copper, and by trial discover which pieces are fit for their purpose.

**Copper-Plate Printing.** See **Rolling-press Printing.**

**Copper-Plate Works,** in Calico-Printing. The application of engraving has given birth to a new and important branch of calico-printing. It first introduced those machines whose subsequent improvement has so much contributed to the perfection of the art, and which surpass the ordinary mode of block-printing, not only in neatness, accuracy, and precision, but still more in the economy and activity with which the labour is performed.

These machines are of two kinds, the flat presses, and the rolling or cylinder presses. The flat presses, in its original form, was merely a modification, considerably enlarged, of the press for ornamental prints or engravings; to which was added a contrivance for joining, with accuracy, the numerous and facsimile impressions necessary to cover a piece of cloth. It was confined at first to one colour, but later improvements have extended it to two and even three. The single colour presses are, however, principally in use.

The cylinder, or rolling-press, is of later invention, and differs from the former chiefly in the substitution of an engraved cylinder for a flat plate. With the latter the cloth is printed by facsimile impressions, in which the accuracy of the joining is of great importance: in the rolling-press, the revolution of the engraved cylinder forms one continuous impression, from one end of the piece to the other, in which there are consecutively no joinings. This is a great advantage, especially in small and delicate patterns, where a variation of a hair's breadth in the joint is readily perceived; but its great superiority over the flat presses consists in the economy of time and labour. With a well-constructed cylinder-press, and proper arrangement for accelerating the work, one man and a boy will print 200 pieces, of 28 yards each, in the same time that a flat press man will print 12 pieces, or a block printer 8; that is, in one day. They are constructed to work one, two, and even three colours, but are generally confined to one; the difficulty and delay in adjusting the several cylinders to each other, when more than one colour is worked, counteracting, in great measure, the chief advantage of the machine. For a description of these presses, and the mode of working them, see **Press.** See also the article **Engraving.**

**Copperas,** a term employed popularly and by the old chemists synonymous with vitriol. Of Copperas there are three kinds, the **Green or Sulphat of Iron,** the **Blue or Sulphat of Copper,** and the **White or Sulphat of Zinc,** which bee.

The former is distinguished in common by a variety of names, as Martial vitriol and Roman vitriol, but most commonly by the names of green copperas or green vitriol. It is seldom made by the direct combination of sulphuratic acid, with the oxd of iron, which constitutes this substance, except for the purposes of experiment in the laboratory of the chemist. The common, as well as the refined, is manufactured on the large scale, as an article of commerce, in the neighbourhood of collieries, and is in some instances found native. It was known to the ancients, as Pliny informs us, (N. H. i. xxiv. c. 12.) and denominated by them Mity, Sory, or Caleanthum. Concentrated sulphuric acid has scarcely any action on iron; when it is heated the acid is decomposed, part of its oxygen combines with the iron and formphorous acid gas is evolved, but when diluted sulphuric acid is added to iron filings, a violent effervescence takes place, and hydrogen gas is disengaged; in this process the water, with which the acid is diluted, is decomposed, the oxygen of which combines with the iron; and converts it into an oxide, whilst the hydrogen escapes in the form of gas, the solution is of a green colour, and by evaporation affords crystals of sulphate of iron which are transparent, of a fine green colour, in the form of rhomboid prisms, having an acid astringent taste; this salt almost always reddens vegetable blues, is very soluble; two parts of cold water, or less than its weight of boiling water, being sufficient for its solution.

The mode of preparing it, as an article of commerce, is pursued principally, as before observed, in the neighbourhood of coal pits, in many of which a substance is found in great abundance, which, though injurious to the coal, forms nevertheless a valuable material as being the basis of copperas, known by the name of pyrites or brasses; these are carefully separated from the coal, and the necessity which this labour occasions, is amply repaid by the produce of the manufacture; the procxes is at once simple and economical, and does honour to the intelligence of those who flirr feggeht it. A large area of ground is inclosed, to which a gentle but sensible declivity is given; the surface is made quite level, and covered with an uncultivated clay, which is every way extended and smoothed, as if plattened, in order to prevent the water from infiltrating into the earth; at the same time a funnel is formed in the midst of the area, for collecting all the water in one point, and conveying it to a reservoir; the area being thus prepared, the pyrites are spread all over its surface, in layers one above another to the height of several feet; care is taken in placing the different pieces to leave intervals for the adnmission of the air: now these pyrites contain iron in combination with sulphur, when they are exposed to the alternate action of water and the atmosphere, they undergo a material change, the water is decomposed, one of its constituent parts, namely, the oxygen, combines with the sulphur, and forms sulphuric acid, or oil of vitriol; the hydrogen escapes into the atmosphere, by this means a soluble powder is formed, the tinge of which is aulbre and alptic; the decomposition is materially assisted by occasionally turning the pyrites with rakes having long iron teeth, like those used in Glasgow and neighbouring places, for stirring the boiling ingredients of the glue maker, by which means new surfaces are presented to the action of the atmosphere. In summer, when it is long dry weather, it is necessary to sprinkle the brasses frequently with water, to wash away the salt which is already formed, and also to produce that humid warmth which accelerates still further the decomposition; gentle showers are therefore excellent for bringing forward this part of the operation. The water loaded with vitriol, finding
finding a clay bottom, which prevents its losing itself in the earth, flows down the inclined plane, and falls into the reservoir, in which a quantity of old iron is placed, purchased principally from the smiths and the cooperers, as their refuse. It is well known that, during the decomposition of the pyrites, more sulfuric acid is produced, than can be contained in them; it neutralizes; the refuse iron is therefore placed in the reservoir and the liquor run upon it, in order to combine with the superabundant acid. The natural evaporation which takes place here adds to its strength, and, when it is conceived to be properly prepared, it is drawn off into a second reservoir, attached to the workhouse of the manufactory; from thence it passes into leaden boilers, where it is made to boil and evaporate by a large fire, formed of the most inferior kind of coal; when the liquor is brought to a proper flatness, it is run out by flypoops, or drawn out by pumps, into long wooden troughs, where it is crystallized by the operation of cold, the crystals attaching themselves to twigs and branches of trees, which are suspended in the troughs for the purpose of being hung over pieces of wood, several of which are laid across the top of each trough; from these branches they are taken and dried, and are then ready for the market.

Refined Copperas is an improvement in the mode of preparing copperas, and was discovered by the late Mr. Thomas Barnes, of Walker, near Newcastle-upon-Tyne, a coal vessel of the first eminence in that neighbourhood; this is effected by merely evaporating hill further than in the common mode, the water of crystallization, and attending about the whole proceeds to a little more cleanliness and exactness in the manipulations.

Two or three men are sufficient to manage a manufactory of either kind, and to produce a great quantity of the articles; considering which, and the rate it sells at, present (1806) from 10 to 14d. per ton, it ranks with the most beneficial manufactories.

Amongst the few places in which this salt is found native, we shall only notice that at Hurlet near Paisley, in a stratum of scinitus, sunk through in 1765 to a seam of coal, pyrites abound so much, that native copperas is sometimes found; it does not in this instance lie in any regular bed, but is intermixed through the stratum, and separated from the coal by the workmen. These works were established in 1757 by a company of gentlemen from Liverpool, for the sole purpose of making alum, but finding both pyrites and native copperas, they added the manufacture of that article also.

COPPERAS. See PYRITES.

COPPERMINE, in Geography, a large river in the central parts of N. America, reckoned to be the most northern in the American continent. Pursuing a northern course, it falls into the sea in lat. 72°, and W. long. 120°, according to Mr. Hearne, and 113° according to the position alluded to by Mr. Arrowmith. In 1771 Mr. Hearne arrived at this river, who found that it flows into the Arctic ocean, or rather, as he intimates in the preface to his book, published in 1795, into an inland sea like that of Hudson. From his journeys, performed in 1769—1772, we may infer, with a great degree of confidence, that the search after a N. W. passage is not likely to succeed. Upon his arrival at the copper river, on the 14th of July 1771, the savages who attended him murdered, in a shocking manner, some Mikem families. On the 17th he was within sight of the sea; and commencing his survey, pursued it to the mouth of the river, which he found so full of shoals and falls, that it was not navigable even for a boat, and that it emptied itself into the sea over a ridge or bar. As the tide was out, he perceived

by marks on the edge of the ice, that it flowed about 12 or 14 feet, and of course could reach but a little way within the river’s mouth, and he found the water perfectly fresh.

He concluded that this river ran into the sea, or some branch of it, by the quantity of whalebone and seal-skins which the Thayers (Elkseers) had at their huts, and also by the number of seals which he saw on the ice. It has been suggested that, as he did not take the water, which seems somewhat surprising, this sea, or branch of it, as he conceived it to be, might have been a fresh water lake. Seals, it is observed, are not uncommon in the sea of Baikal, and the whalebone might have been procured in barter. The supposed tide is not unknown on occasion of high winds in the southern lakes. However this be, Mr. Hearne says, that he had an extensive view of the sea, and that, from the mouth of the river, it was full of islands and shoals, as far as he could see with the assistance of a good pocket telescope. The ice was not then broken up, but was thawed for about 3 of a mile from the main shore, and a little distance round the islands and shoals. The Ikimos here were of a dirty copper colour, and rather shorter in stature than those to the south. Their kettles were made of lapis sullaris, of a mixed brown and white; and their hatchets and knives were of copper. The dogs have sharp creet ears, sharp noses, and bushy tails, being a fine breed of that sort. Many kinds of sea fowl were observed; and in the ponds and marshes swans, geese, curlews, and plovers. The quadrupeds are mule cattle, rein-deer, brass wolves, wolvereens, foxes, Alpine hares, squirrels, ermines, mice, Mr. Hearne, in the prosecution of his survey, visited one of the copper mines, about 30 miles S.E. from the mouth of the river, which was merely a hill that seemed to have been rent by an earthquake, or perhaps by subterraneous water. The copper is found in lumps, and is beaten out by the help of fire and two stones.

COPPER, MINE hills, hills of N. America, in N. lat. 68° 50’. W. long. 112°.

COPPET, a small town of the Pays de Vaud, in Switzerland, delightfully situated on the banks of the lake of Geneva, 12 miles N. of Geneva. It is an ancient Swiss barony, comprising eight villages besides the town; its territory produces excellent red wine. The castle which commands the lake sustained an obstinate siege in 1558 against the troops of Berne, who at last reduced it to ashes. In the year 1657 the barony of Coppet was bought by Frederick, count of Dohna. He rebuilt the castle in a modern style, but his son sold the estate to an inhabitant of St. Gall, from whose descendants it was purchased some time before the French revolution by the celebrated Necker, who expended large sums in embellishing the seat, the situation of which is truly enchanting, and where he closed his chastened career.

He left it to his daughter, the baroness of Stahl Hollein, whose name is dear to French literature, and who was banished to this estate in 1807, for having produced the interesting novel of Corinna. Durand. Statistique Elemenarle de la Suisse 1795.

COPPI, JACOPO, in Biography, confided by Lanzi the fame person with Jacopo del Megio, was born in the Florentine state in 1527, and was employed, in concurrence with the other expert mannerists of his school, in the large altar pictures of the church of Santa Croce at Florence. If, however, we may judge from the critiques of Borghini and other writers, his merit upon this occasion appeared less conspicuous than in some small pictures of fabulous subjects, which formed part of the ornament of an elevato executed, under the inspection of Vafari, the chief of the Florentine seigniour of that period, for the prince Francescone de Medici; but his masterpiece is a picture representing the crucifixion in
in the church of St. Salvatore at Bologna, which, according to Lanzi, is nowise inferior to the finest works of Vajari himself, and may indeed rank with the best productions of the Bolognese artists prior to the Caccia. It is dated 1579.

The artist died in 1611. Lanzi, Storm Pittorese.

COPPICE, in Rural Economy, a low form of inclosed wood, which is cut over at stated periods, for different purposes.

Thickly covered woods, wherever there is much demand for the various small fluffs which they are capable of affording, yield considerable returns to their owners; particularly where proper care is taken in felling and preserving them against live flocks.

In cases where new coppices are to be raised, it is necessary to bestow great attention on the nature of the soil, and the exposure of the land; adapting the trees and plants to the nature of these, as much as possible; and at the same time, taking into consideration the sorts that are the most useful, and most in request in the particular district or vicinity: as this sort of wood is in general disposed of to the greatest profit and advantage, where there is little trouble of carriage. The ground should be well drained, where it is inclined to be wet, and also well inclosed from the cropping of cattle. Some likewise advise, that where it is covered with bushes or briars, that they should remain to shelter the young growth of wood; and that if there happen to be a moderate quantity of young oak and ash-trees on the spot, to let them stand by all means; always keeping in mind how necessary shelter is for the growth of wood of all kinds and sorts.

But that in newly planted coppice-woods, where all the plants are of the same age, there is not the same reason for letting them stand before they are felled off for underwood, as for young trees planted to fill up old woods. Those which are intended for underwood may, in such newly planted woods, be cut off when planted, or at any age from eight to fourteen years, without injury. Indeed, young woods should not stand too long previous to the first cutting. It is observed in the seventh volume of the Letters and Papers of the Bath Society, that the kinds of wood to be planted in coppices, either in making new ones, or filling up old ones, should be regulated partly by the demands of the country, but chiefly by the peculiar aptitude of the soil and situation to produce particular sorts. Let nature be the guide, says the writer, in planting, and you will seldom do wrong. Particular soils and particular situations will always favour particular kinds of trees; we need not look for the reason, but only for the fact.

The chalk hills of Hampshire are peculiarly proper for beech; the flinty loams and clays of the county, for oak and ash; the sandy steep sides of the Wiltshire downs, for hazel; and the sands of the same district, for alder; the rugged and almost naked rocks of Mendip, in Somersetshire, produce the lime tree and the walnut in the greatest luxuriance; and on the highest parts of the same Mendip hills, where no other tree can land the sea-breeze, lycamore flowering as well as in the moister fertile valley. Taking the general demand of counties, and the peculiarities of different soils, into consideration, it is affected that there is no kind of wood so generally proper for planting in coppices as ash: the value of ash poles being at least one-third more, and frequently as much again, per hundred, as that of other poles, as being applicable in all sizes to some useful purpose or other; the timber being always in request, and saleable at any age or size, at almost the price of oak; and the wood itself being as quick a grower as any, and quicker than most; and, above all, there being but few foils, from the blacket and wettet bogs to the highest and most exposed mountains, where it will not grow, are reasons why ash is one of the most profitable woods to plant in such coppices as are favourable to its growth. In soils and situations where ash does not grow kindly, let such other sorts of wood be planted as appear to thrive best in similar soils and situations in the same county. Spanish chestnut, though not for general a grower as ash, is a most excellent wood, either for timber or underwood, and wants only to be more known to be higher in estimation. It parts much of the properties of oak, but excels it in two points, namely, that it grows faster, and that the sap part of the timber is firmer and less corruptible. To fill up woods that are become thin by age or neglect, the proper time is one year, or at the utmost two years, after the underwood is cut. The young plants should be eight or ten feet high, and an inch and a half diameter at the ground, and should be planted without cutting off. If the soil be dry, no other preparation is necessary than barely digging the holes for the plants; if wet, deep drains should be made, to take off the superabundant water. The earth dug from these drains should be thrown out on the lower side of them, and upon this new earth the plants should be planted. If land of this latter description be black and peaty, ash is peculiarly proper for it; and will, if planted on the earth thrown from the drains, make a most surprising progress. If it be a stiff yellow clay, it is generally more favourable to the growth of oak than of ash. In such soils, oak for timber, with a mixture of willow, birch, alder, and Spanish chestnut, for underwood, will perhaps be the most proper. All these kinds should stand one round of the underwood; and if still weak, should stand two, before those are cut off which are intended for underwood. Birch plants are indeed an exception to this rule: they should always be cut off the first round of the underwood; for, if they are large when cut off, the flocks frequently decay and die. In all mixtures of kinds of wood for coppices, those sorts should be used which are not unfriendly to each other, and which will come round fit to be cut together at the same periods; and such kinds should be allowed to stand for timber, and that at such distances as to injure the underwood as little as possible. The plants for filling up old decayed woods of the coppice kind, should be the strongest and best of their kinds. Those which are weak at first will be drawn up by the surrounding underwood, and become, from their increased height, still weaker. At the next cutting of the underwood, they will be blown down; or, if cut off, the shoots will too soon and too fast grow up with the other underwood. Oak, ash, and Spanish chestnut, should be kept in a nursery for this purpose. Alder and birch plants grow plentifully spontaneously in some countries, and may be taken up for use; if none fresh are to be obtained, they may be raised from seed sown on a moderate hot-bed, in the open air. Alder is sometimes propagated by taking up old roots, and dividing them into several parts; and hazel may be propagated the same way. Willow is generally planted in cuttings; but a much better way, where there are any out willow flocks, is to plash down the shoots, and fill up the vacant places round such old flocks. The wild cherry, which will grow on almost any soil, and is easily propagated, makes an exceedingly good underwood, though as yet it is but seldom used for that purpose.

It is remarked by the author of Modern Agriculture, that the coppice-woods, when the flocks are young, whether of oak, ash, elm, or birch; or a mixture of these with other sorts, are very little attended to in any part of the island, fencing being the only particular which marks the difference between a good and a bad manager. But, he says, when the wood can be sold for different useful purposes, at various prices,
flashes of its growth, as is the case in many parts, an essential improvement in the management of coppices might be introduced with great propriety. In all such situations, if it would be profitable to the owners, were the shoots thinned two or three times between each general cutting. The weedings or thinnings would do much more than delay the expense, while, by admitting a more free circulation of air, and by cutting off the supernumeraries, the principal shoots would advance more rapidly, and become by that means fit for sale, perhaps, two or three years sooner than they do by being allowed to remain in a neglected state. This is a circumstance that particularly merits the attention of those who are favorably situated, in regard to market, for the various productions of coppices; as having two or three years in the regular cuttings would materially enhance the value of the land so occupied.

He further states, that several other improvements in the management of coppices might certainly be effected, were the owners to bestow due attention. It frequently happens, that, from mismanagement in cutting, many of the ftools become useless, while scraggy thorns, brambles, &c., are allowed to spring up, and occupy the place of more valuable plants. Were the owners of coppices in general to permit their labourers, or other indigent poor people in the neighborhood, to dig up the decayed ftools and useless fbrush-wood for fuel, under condition that they plant healthy vigorous ftools in their places, the coppices by this management would necessarily become more valuable. Much damage also frequently happens from allowing the unfelling wood to remain scattered over the surface of the ground, for a considerable time after it is cut. Every person must be sensible, that if the cuttings are allowed to remain in this situation till after the young fshoots begin to spring, it is scarcely possible to remove them without breaking or otherwise injuring these tender sprigs. In all auctions of coppices, it ought, therefore, to be an article of sale, that the whole should be carried off the premises in a limited time; and the forester, or wood-officer, should receive injunctions to see this condition of the sale strictly fulfilled.

Much greater care is requisite, the same writer says, in cutting coppices properly than the owners, in many cases, are disposed to bestow. It cannot be supposed, when fifty or a hundred purchasers, with their attendants, are allowed to use their axes with no other view than to cut the wood which they have purchased, without regard to the successe of what may be called the next or following crops, that any regard will be beclawed as to the proper manner of cutting. It is certainly of much importance, not only for the future vigour, but also for the durability of the ftools, that the items or fshoots should be cut in that manner which experience has proved most effectual for answering both purposes. The fshoots ought to be cut as low as possible, without injuring the ftools. When that practice is adopted, the ftools remain nearly even with the ground, and consequently in a much better state of preservation than by cutting the fitems at the height of six, eight, or ten inches; as, by this method of cutting being frequently repeated, the ftools get in process of time, as he has frequently seen, to the height of several feet above the surface soil. Another common error, and which woodcutters of the above description may be supposing very guilty of, is to leave the butt ends of the fitems jagged and uneven, and part of the bark torn off, or loosened all the way down to the floor, in which nothing can be more injurious. The butt-ends of the fitems ought rather to be brought to a point in the middle, and the bark remain quite close and firm, otherwise dew and rain drop into the hollows, and either rot or otherwise prove ruinous to the future health and vigour of the ftools. In short, to render a coppice both valuable and lasting, a larger system of management ought to be adopted. For the reasons mentioned above, they ought to be thinned two or three times between every general cutting. The useless fbrush-wood ought to be rooted out, and other more useful plants substituted. Where too much water abounds, drains ought to be opened; the fences at all times kept in a substantial state of repair; and on no consideration whatever should the purchasers of coppices be allowed to cut the underwood.

Men employed by the owners, and who are properly bred to the businefs, ought only to be employed; who, by following proper pains in dressing and pruning the ftools and ftools as they go along, would thereby ensure the springing of numerous and vigorous fshoots the following season.

The periods of cutting coppice underwood must be regulated, it is observed in the work first mentioned, by the luxuriance of its growth, and by the demand of the country, and the uses to which the wood is to be applied when cut: but, in general, the common rule of trade will hold good here, viz., “that small gains and quick returns make the dealer rich, but long credit ruins.” In the article of underwood, not only the interest of money, but the loss of the trees, and the advantage of the wood will be cut as early as it is fuitable. As soon, therefore, as any kind of wood is fit for the uses of the country, it should then be cut; unless it can be made appear, that it will pay compound interest for standing longer, or, in other words, will pay not only the simple interest of the first value, but also the loss of so many years growth of the wood, as far advanced towards another crop. Wood merely for fuel can scarcely be cut too young.

Hazel is usually fit for hurdles and dead hedges, from nine to twelve years old; ash for sheep-cribs, at the same age; and ash and other woods for hop-poles, from eleven to fourteen years old: while ash for carpenters, and other large uses; alder, birch, and willow, for rafters, turner’s uses, pattens, clogs, coal-pit uses, &c. muft stand from sixteen to twenty years, before the poles are large enough for their respective purposes. It therefore behoves every owner of woods of the latter description, unless he is public-spirited enough to give up his own profit to the good of the public, to consider well before he suffers his wood to stand to the age of sixteen, eighteen, or twenty years, whether the value of such wood, when cut younger, and sold for other purposes, added to the interest thereof up to the usual period of cutting, and the gain by the growth between those two periods, will not more than equal the value the wood will be of, if suffered to stand so long; and if so, whether he ought not to cut his wood at shorter periods. He will have this additional satisfaction, that, by more frequent cuttings, his wood will be the less liable to decay, by the strong shoots smothering the weak ones, as is before explained: and will have an opportunity of letting up more fapolings for timber than he could otherwise do. There are many opinions respecting the most proper time of the year for cutting underwood, but there is one rule which, on the feller’s part, is without exception, viz., that the older the wood is, the later in the spring it should be cut. When old wood is cut early in the winter, and a hard winter follows, the damage done to the ftools is very great: young flourishing wood will bear cutting at any time. But on the part of the buyer, it is allowed that all woods are more durable, when cut in the most flagrant state of the sap; and in all cases where heding is required, such as hulks, hoops, and even dead hedges, the wood cannot be cut too early in the winter, being,
ing, if cut when the sap is rising, brittle, and unfit for those purposes. Oak underwood will, at the present price of bark, pay well for standing till the sap is up for barking it; and it seldom happens that the flocks are injured by cutting it fo late in the year.

The best way of disposing of coppice-underwood, to answer the purpose of the farmer, is, in the opinion of this writer, to cut it at the seller's expense, before it is fold; to lay it out in ranges or drifts, according to the custom of the country; to value it in that state, and fell it in such fixed lots as the number of buyers may warrant: always keeping up a sufficient number to make a competition, and particularly to oblige the buyers to clear the whole out of the wood by the 24th day of June; and never to furnish them to bring their horses into the woods, after any new flocks are shot out, without puzzling them, or at least tying up their heads.

But in the View of Modern Husbandry, Mr. Donaldson thinks, that the more approved method of disposing of coppice, or other under-sized wood, is that which is practised in Northamptonshire. When the season for cutting arrives, which is during the winter months, or before the sap begins to ascend, that operation is performed by people employed by, and who work under the direction of, the owner of the woods or his agent. The part of the wood intended to be sold, is parcelled out into regular fixed lots, to suit the convenience of the intended purchasers. The whole of the underwood, growing upon each lot, is indiscriminately cut, and laid in one direction. As soon as the operation of cutting is completed, and the wood parcelled out in a proper manner, a valuation is put on each lot or parcel according to its quality, and the whole is then sold by public auction to such persons as incline to become purchasers, who, over and above the price of the underwood, repay the expense of cutting. This is, however, by no means the general mode in which woods of this description are cut. It is a very common, but a very bad, practice, to fell the coppice under the condition that the purchasers are to be at the expense of cutting it down. This is often performed in such a careless manner, that the flocks are so greatly injured, that they either rot or die, or a few weak flinted shoots only springing up.

The price of coppice or underwood varies so exceedingly, that it is almost impossible to form any idea of the value of the acre. Perhaps 8 or 10l. may not be far from the average price of coppices, not remarkably situated in regard to market, and when they are cut every twelve or fourteen years. But the value of coppices depends on many circumstances; as the roots of wood, the ufs to which they are applied; the price of bark, &c. In some parts of Kent, where hop-poles are in great request, an acre of coppice will yield sometimes 30 or 40l. at a cutting. Whereas in Scotland, where the coppices are for the most part oak, and where the wood is chiefly used for fuel, or converted into charcoal, the value of the coppices consists almost entirely in the quantity and quality of the bark, the wood being little more than sufficient to defray the expense of cutting and peeling.

Mr. Mathlill, in his "Management of Landed Estates," has remarked, in respect to flub or coppice wood, that "the proper harvesting it as of timber, depends on situation and other circumstances. And that the age or fire of cutting must ever be guided by the demand in a given district; whether it be for the use of coal-mines, or for cord-wood, hop-poles, hoops, flocks, faggot-wood, or other ware."

"The mode of disposing is," says he, "to be determined upon by the succeeding crop. If the land be intended to be appropriated wholly to coppice wood, it is generally the most eligible to dispose of the crop, as it stands, by auction or proposal. But if seedling plants are to be set out for timber stands, or the young flubs from the fubs to be trained up, in the grove manner, it is requisite that a proprietor should employ his own people in reaping the crop, and making it up into such wares as are the most saleable and profitable."

"In cutting down coppice-woods, the main objections are," he thinks, "to cut them in seafon, to take off the flems, clean and smooth, with upward strokes of the axe, that the flubs may shoot with the greater certainty; and to cut them off as low as convenience will allow, in order that the shoots may be few and vigorous."

Coppice-Wood, is that sort of small woody growth, which is raised in inclosed woods of the coppice kind, and which is converted to various purposes of the farmer and manufacturer, such as cord-wood, hop-poles, hoop-fluff, hedge-fluff, faggot-wood, and various other wares.

COPPLE-STONES, in Natural History, globuli lapid. rotul. lapidae, boulder-stones, rolled-stones, or pebbles, as some call them, are rounded and worn fragments of stones and rocks, that are not invested with an exterior flinty crust or skin, occasioned by concentric laminae of the stone, but which the internal plate laminae broken off and rounded at their edges by attrition. It is of the utmost consequence, in all researches relating to the strata of the earth, to distinguish carefully between Coppie or boulder-stones, and original nodules of the strata.

COPY, in Rural Economy, is a term sometimes provincially employed to signify a wood of the coppice kind. Thus to copy, in some districts, signifies to cut over for underwood.

COPRATAS, in Ancient Geography, a river of Asia, in the Parthian territory, mentioned by Strabo and Diodorus Siculus; the latter of whom says, that it discharged itself into the Tigris.

COPRIS, a name given by Strabo to a shore of Sicily before Taormenium, because the wrecks of vessels that were lost in the gulf of Charybdis were collected in this place.

COPROCRITICA, from ἐκκατέρωσις, excrement, and ἐκκατέρωσις, separate; medicines which purge away the excrements in the guts.

COPROPHAGOS, from ἐκκατέρωσις, and ιππ. ἐκτρ., the dung-fly, in Natural History, the name given by many authors to the common yellowish fly found on human excrements. There are several other species found on the excrements of various animals, and hence called merdices.


Gen. Ch. Hermacrpidia-flowers. Col. Perianth inferior, one-leafed, short, live-touched, permanent. Cor. monopetalous, b-loll-shaped, much larger than the calyx, five, six, or seven-ellipt. segments seate, erect. Stam. Filaments five, or seven, capillary; anthers oblong, bised at the base, erect, a little incurved, acuminate. Fil. Gom. superior, oblong; styles two, ribiform, slightly cohering at the base, longer than the corolla, divergently; stigma simple. Peric. Berry ovate-globular. Seeds two, flat on the inner,
under, and convex on the outer side, separated from each other by the pulp of the berry. Male flowers, Cal., Cor., and Stam., as in the hemiphrodite. Pitt. abortive.

Eff. Ch. Calyx one-leaved, five-toothed. Corolla five, six, or seven-eleft. Stamens five, six, or seven. Styles two, long. Berry with two seeds.


COPSE, in Agriculture, a term applied to the regulating iron apparatus, which is fixed to the end of the beam of a plough, and to which the team is attached. These irons are of very different forms and contructions according to circumstances.

COPTIS, in Botany, (from κόπτω, fendo; a name taken from the cut leaves of the plant.) Linn. Trans. vol. viii. p. 355. A genus formed by Mr. Salisbury for Helleborus trifolius of Linnaeus, which differs from the other helbores, in having a caducous corolla. See Helleborus trifolius.

COPTISES Nomos, a name of Egypt, extending along the bank of the Nile, which derived its name from Coptos or Coptis, its capital.

COP'TOSKILL, in Geography, a town of America, in the state of New York; 42 miles N. of New York.

COP'TOS, Coptus, or Coptis, in Ancient Geography, now Kepes, a city of Upper Egypt, three miles distant from the Nile, and connected with it by a navigable canal. It was the centre of communication between Egypt and the Red Sea, by a N.E. route to Myos Hormus, situated on the western coast of the Red Sea, and by a S.E. course to Berenice, which was the staple of the trade with India. If Ptolemy is to be credited, Isis, upon receiving the news of the death of Ophiis, cut off one of her locks in token of grief; and hence the place was named Coptos, which, in the Egyptian language, is said to denote want or privation. This city was inhabited both by the Egyptians and Arabs, and Ptolemy calls it the emporium of commodities brought from India and Arabia, which were conveyed by the Nile to Alexandria. Ptolemy mentions Julopolis, as being two miles distant from Alexandria, and says that from Julopolis to Coptos, the voyage of 303 miles was performed in 12 days, when the northerly winds blew; the distance between Berenice and Coptos was, according to the same author, 258 Roman miles, and the journey was performed in 12 days. The road, however, lay through the defant of Thebais, almost entirely delitnate of water; but Ptolemy Philosophus not only repaired the road, but made provision for supplying the want of water by farrishing for springs; and wherever these were found he built inns, or more probably in the exterior style caravaners, for the accommodation of merchants. (Strabo, lib xvii. p. 1157.) In this channel the intercourse between the east and west continued to be carried on during 250 years, as long as Egypt remained an independent kingdom. The Cnibrians were formerly very numerous in the city of Coptos. The rubbishes of this ancient city may fill a circumference of two miles, and sufficiently evinces its former extent. Amidst the ruins are seen several small columns of grey granite lying on the ground, and some large stones, engraved with hieroglyphics. Near it is also a small part of a bridge over the canal by which water was conveyed from the river into a large basin. This place has occasionally afforded medals, small fragments of earthenware, pieces of rock crystal, and precious stones.

COPULA, in Logic, a verb that connects any two terms in a proposition, either negative or affirmative: as, A rofe is foon; where it is the copula.

COPULATION. See COITION, CONGRESS, and COMMUNICATION.

COPULATIVE Propositions, are those which include several subjects, or several attributes joined together by an affirmative or negative conjunction.

Thus, v. gr. Power and riches do not make a man happy.

Where and is the conjunction that couples power and riches.

COPULATIVE Conjunction. See CONJUNCTION.

COPY, in Law, a transcript of a writing or instrument, made for the use and satisfaction of some of the parties concerned; or in order to preserve the memory thereof. See COPIA.

The copy of an inrolled deed is admitted in evidence; but not the copy of a will of lands nor the probates, nor of a common deed where the original may be procured. Few ancient documents do now subsist otherwise than in copies.

Copy is also used for an imitation of any original work; particularly a painting, draught, figure, &c.

The following proofs for taking a copy of a recent MS., was communicated to the Philomathic Society at Paris, by M. Charles Coquebert. 1 It consists in putting a little sugar in common writing ink, and with this the writing is made on common paper, fixed as usual, when a copy is required; this unfixed paper is taken and lightly moistened with a sponge. The wet paper is then applied to the writing, and a flat iron, such as is used by launderers, of a moderate heat, being lightly passed over the unfixed paper, the counter-proof or copy is immediately produced. This process is the more interesting, as it requires neither machine nor preparation, and may be used in any situation. That sugar prevents ink from speedily drying, has been long known (i.e. ink); and this method of imprefion has been used in some of our public offices, and elsewhere in England, for some years.

Copy, among Printers, denotes the manuscript or original of a book given to print from.

To call off a copy, is to make a computation of the number of sheets a manuscript will make in print.

In the bookmakers' style, a good copy is that which produces a faleable book.

Tenent by Copy of court roll. See Tenant.

COPY-HOLD, is a tenure for which the tenant has nothing to shew but the copy of the roll made by the reward of the lord's court.

The reward of the court is, among other things, to inroll and keep a registar of all such tenants as are admitted to any parcel of land, or tenement, belonging to the manor; and the transcript is called the copy of the court-roll, which the tenant keeps as his own evidence.

This tenure is called a life tenure, because the tenant holds, in some sort, at the will of the lord. Fitzherbert says, it was formerly called tenement in villanous; and that copy hold is but a modern name.

This
This is the land which the Saxons called *folkland*, as being held *sine frigio* in contradistinction to *boculand*, or charter-land, *sine ecrifta*, and new free land, or *free hold*. However, it is not simply at the lord's will, but according to the custom of the manor; so that if the copyholder does not break that custom, and forfeit his tenure, he seems not to stand at the lord's court. These customs are infinite; varying in one point or other, almost in every maner.

Copy-holders are, in reality, no other but villeins (*villeg*), who, by a long series of immemorial encroachments on the lord, have at last established a customary right to those estates, which before were held absolutely at the lord's will.

This affords a very substantial reason for the great variety of customs that prevail in different manors, with regard both to the defendant of the estates, and the privileges belonging to the tenants. By various means the generality of villeins in the kingdom have long ago sprouted up into copyholders; their persons being分支机构 by manmination, or long acquiescence; and their estates, in *fringe*, remaining subject to the same servile conditions and forfeitures as before; though, in general, their villein services are usually commuted for a small pecuniary quit-rent. In some manors the copy-holders are bound to perform the most servile offices; as to hedge and ditch the lord's gardens, to chop his trees, and reap his corn, and the like; the lord usually finding them meat and drink, and sometimes, (as is still the case in the highlands of Scotland) a minareel or piper for their diversion. Thus also, in the kingdom of Whidah, on the coast of Africa, the people are bound to cut and carry in the king's corn from off his demesne lands, and are attended by music during the whole time of their labour. See *Whidah*.

The custom of the manor is the life of copy-hold estates; for, without a custom, or if copyholders break their custom, they are subject to the will of the lord; and as a copyhold is created by custom, it is also guided by custom. (4 Rep. 21.) A copyholder, whilst he performs his services, and doth not break the custom of the manor, cannot be ejected by the lord; if he he, he shall have trepals against him:—but if a copyholder refuse to perform his services, it is a breach of the custom, and forfeiture of his estate. Some copyholders hold by *the verge in ancient demesne*; so that though they hold by copy, they are a kind of free-holders; some others hold by common tenure, called "mercy copyhold," whose land, upon the commiss of felony, echeats to the lord of the manor.

It should be recollected, however, that copy-hold land cannot be made at this day; for the foundation of a copyhold is, that it hath been demised time out of mind, by copy of court-roll; and that the tenements are parcel of, or within the manor. 1 Init. 58. 4 Rep. 24.

Estates held by copy of court-roll, and not at the will of the lord, have been demised free-hold by lord Coke (1 Init. 59 b.) and also by others; and by way of deputation from the ordinary kind, they have been denominated "customary free-holds." Tenants of this description have claimed the right of voting at the election of the knights of the shire. But the flat. 31 Geo. II. c. 14, enacts, that no person holding by copy of court-roll, should have this privilege.

In some manors, where it has been the custom to permit the heir to succeed the ancestor in his tenure, the estates are called "copy-holds for life," in others, where the lords have been more vigilant to maintain their rights, they remain "copy-holds for life," only; for the custom of the manor has, in both cases, so far prevailed the will of the lord, that the services be performed or stipulated for by fealty, he cannot, in the first instance, refuse to admit the heir of his tenant upon his death; but, in the second, he must remove his present tenant, so long as he lives, though he holds nominally by the precarious tenure of his lord's will. If the lord refuses to admit, he shall be compelled in chancery. (2 Cro. 358.) And if the lord refuse to admit a surrender, on account of a disagreement about the fine to be paid, the court of B. R. will grant a mandamus to compel the lord to admit without examining the right to the fine. (2 Term Rep. 484.) But that court will not grant a mandamus to admit a copy-holder by defect; because, without admittance, he has a complete title against all but the lord. (2 Term Rep. 193.) Copy-holds descend, according to the rules and maxims of the common law (unless in particular manors there are contrary customs of great antiquity) but such customary inheritances shall not be affected; to charge the heir in action of debt, &c. (4 Rep. 22.) though a lease for one year, of copyhold lands, which is warranted by the common law, shall be affects in the hands of an executor. (1 Vle. 63.) Copy-holders hold their estates free of dower, being created by custom, which is paramount to title of dower. (4 Rep. 24.) By particular custom, there may be a dower and tenancy by the curtesy. (Cio. Eliz. 361.) There may be an estate-tenant in copyhold lands by custom, with the co-operation of the flat. W. II. And as a copyhold may be entailed by custom, so by custom the tail may be cut off by surrender. (1 Inf. 61.) A copyhold may be barred by a recovery, by special custom; and a surrender may bar the issue by custom. A fine and recovery at common law will not destroy a copyhold estate; because common law adjudgments do not work upon the assurance of the copyhold; though copyhold lands are within the flat. 4 Hen. VII. c. 24, of fines and proclamations, and five years non-claim, and shall be barred. (1 Rol. Abl. 506.) Copy-holds are not within the statute 27 Hen. VIII. c. 10, of jointures; nor flat. 32 Hen. VIII. c. 28, of leases; copy-holds being in their nature demissable only by copy; they are not within the statute of uses; nor are copyholds extendible in execution; but they are within the statute of limitation of actions, and the statutes against bankrupts. The lord shall have the custody of lands of ideots, &c. And a copyholder is not within the act 12 Car. II. c. 24, to dispose of the custody and guardianship of the heir; for, if there be a custom for it, it belongs to the lord of the manor. (3 Lev. 359. 1 Nelf. Abl. 493, 522.) A copyholder cannot convey or transfer his copyhold to another, otherwise than by surrender; which fee.

A manor may be held by copy of court-roll, and the lord of such manor may grant copies; and such customary manor may pass by surrender and admittance, &c. The fruits and appendages of a copyhold tenure, which it hath in common with free tenures, are fealty, services, (as well in rents as otherwise,) reliefs, and echeats. The two latter belong only to copyholds of inheritance, the former to those for life only. Besides these, copyholds have also heriots, wardships, and fine. See each of these articles. See also Forfeiture, Freehold, Surrender, and Tenure.

**COPY-HOLDER**, is defined by Weel, a person admitted tenant of any lands, or tenements, within a manor, which, time out of mind, by the use and custom thereof, have been devised to such as will take the same by copy of court-roll, according to the custom of the said manor.
COPYING of LETTERS, and other curiosities. The celebrated Dr. Franklin made several essays, many years ago, for speedily multiplying the copies of his own hand-writing, which he exhibited to M. Alexis Rochon, of the French National Institute, and director of the Marine Observatory at the port of Brest; an account of which he has given in his memoir on the Typographic Art. This method consisted in writing upon smooth paper, with ink containing much gum, which was afterwards heated with emery, or powder of cast-iron, and by means of a rolling-press, such as is used by the copper-plate printers, the strokes of the writing were transferred to a plate of soft copper or pewter. This plate supplies as many copies as the depth of the engraving can allow; but the copies are far from being beautiful, and the ground is spotted and foiled. Before Dr. Franklin’s process was communicated to M. Rochon, he showed him that by writing with a steel point on a copper-plate previously varnished, a more satisfactory result might be obtained, by etching the strokes with nitric acid and to a sufficient depth, for the subsequent use of a liquid ink similar to that of the printers. In this case, the plate may be wiped without precaution, and twelve or more copies may be pulled off upon coarse paper. These proofs are found and reversed; and, therefore, in order to have them neat and in the proper direction of the writing, it becomes necessary to place the same number of leaves of white paper, wetted and prepared, upon the twelve proofs; and while the ink is still fresh, the whole being passed together through the rolling-press, the same number of leaves of counter-proofs are obtained as there were proofs; so that instead of twelve turns of the press, thirteen will be required to supply twelve counter-proofs, very black, neat, and legible, even when the plate has not been perfectly wiped. This method is certainly not to be compared with fine engraving; but it may be useful in military operations, and all other cases in which a speedy multiplication of copies is required. No precaution is here necessary; whether the nitric acid be more or less strong, or remain a longer or shorter time upon the plate, or whether the plate be somewhat heated to increase the strength of the foment, the proofs of the operation will never fail; provided the steel point made use of to trace the characters through the varnish, shall lay the copper perfectly bare. It is of advantage that the nitric acid should bite deep, because the counter-proofs are, by these means, much darker. This might not be well wiped, because it is not of consequence whether the proof which is used to afford a counter-proof should be very clean, provided that it does not spoil the copy intended to be procured. The most liquid kind of printers ink may be used. See ENGRAVING and STEREOTYPE.

In 1780, Mr. James Watt, of Birmingham, obtained a patent for a new method which he had invented to this purpose; of which the following description is given in his specification: Let the letter or other writing, that is intended to be copied, be written with the ink heretofore described, or with any other writing-ink fit for the purpose. Take a piece, or pieces, of thin paper which contains no size, or glue, or gum or mucilaginous matter, or which at least does not contain so much size, or other matter, as would make it fit for being written upon. Cut this paper, or papers, to the size and shape of the writing of which a copy is wanted; moisten or wet the same thin paper with water, or other liquid, by means of a sponge or brush, or by dipping, or otherwise. Having moistened or wet the thin paper, lay it between two thick unsize thickness papers, or between two cloths, or other substances capable of absorbing the superficial moisture from the thin paper; when it has been slightly pressed between such thick unsize paper, or other substances, by the hand or otherwise, lay the said thin paper, so moistened and pressed, upon or under the side of the writing which is to be copied, and in such manner that the one side of the said moistened paper shall be in contact all over the side of the said writing, so intended to be copied; and that to the other side of the said moistened thin paper, there shall be applied a piece of clean writing-paper, or cloth, or other smooth uniform substance. Lay the said writing intended to be copied, with the thin moistened paper intended to receive the copy, (placed respectively as above directed,) upon the board of a common rolling-press, or of such of which a description and drawing are hereunder written and drawn, and press them once, or oftener, through the rolls of the said press, in the same manner as is used in printing by copper-plates; or, instead of using the said or any rolling-press, squeeze the said papers, placed respectively in the manner above described, in a screw-press, or subject them to any other prelure sufficient for the purpose, by means of which prelure, in what ever manner applied, part of the ink of the writing intended to be copied shall press from the said writing into, upon, and through, the said thin moistened paper, so that a copy of the writing, more or less faint, according to the quality of the ink and paper employed, shall appear impressed on both sides of the said moistened paper, vis. upon one of the sides in the natural or proper order and direction of the lines, as they are in the original writing, and on the other side in the reverse order and direction. But, in order to make the impression or copy of the writing more strong, legible, and durable, it is proper and useful to moisten the said thin paper, which is to receive the copy or impression, with the following liquid, instead of water or other liquid, and to proceed in all other respects as is above directed; or to moisten the said thin paper with the following liquid, and to dry the said paper, and, when a copy of a writing is required to be taken, the said paper, thus previously prepared and dried, ought to be moistened with water or other liquid, and to be proceeded with in all other respects as has been directed. The said liquid to be used for moistening the said thin paper, or for preparing the said paper previously to its being used, is made in the following manner: Take of dilute vineger two pounds weight, dissolve in it one ounce of the solid fat of borax; then take four ounces of oiler-shells, calcined to whiteness and carefully freed from their brown crust, put them into the vineger, shake the mixture frequently for four and twenty hours, then let it stand until it deposits its sediment; filter the clear part through unsize paper into a glass vessel, then add to the said mixture or solution two ounces of the best blue Aleppo galls bruised, and place the liquor in a warm place, shaking it frequently for twenty-four hours; then filter the liquor again through unsize paper, and add to it, after filtration, one quart, ale measure, of diffusil or other pure water. It must then stand twenty-four hours, and be filtered again if it shews a disposition to deposit any sediment, which it generally does. The liquor, thus compounded and prepared, is to be used as hath been directed.

N. B. In place of the vineger, any other liquor impregnated with a vegetable acid may be used; and, in place of the galls, oak bark, or any other vegetable astringent, or substance which is capable of becoming black, or deep coloured, with solutions of iron; and, in place of the oiler-shells, any other pure calcareous earth may be used. But if the imprefsums are not wanted to be very black, and the writing ink is good, water itself may be used to moisten the thin paper, as herein first directed. It may be found neces-
fairy to add more or less water, in the preparation of the above liquor to be used for moistening the thin paper, or to vary the proportions of the other ingredients, according as the paper is more or less perfected strong, or as the impression is required to be more or less deep colored. The writing-ink, which the patentee uses for letters or writings intended to be copied, is prepared as follows: Take four quarts of a meal mixture, of spring water; one pound and a half, of a tiny and coarse, of Alepog galls; half a pound of green copperas of green vitriol; half a pound of gum-arabic; four ounces of roach-alum; pound the solid ingredients, and infuse them in the water six weeks or two months, during which time the liquor should be frequently shaken; strain the liquor through a linen cloth, and keep it in bottles, closely corked, for use.

Plate III. Misellaneous, fig. 1. represents a front or end view of the rolling-prea invented by Mr. Watt, and referred to in the above specification. A B C is one of the ends of an iron or wooden frame, which serves to connect the two rollers. D D, are two wooden or metallic rollers, turned extremely exact, or truly cylindrical, and which are mounted on iron axes, firmly fixed in them. E E is a double-ended lever, by means of which the roller, on whose axle it is applied, may be forcibly turned round. F F represents the board of the rolling-preas, on which the writings to be copied are to be laid. N N is a piece of cloth, or other elastic pliable substance, placed next the roller, and above the writings to be copied: and the board. G, is a strong plank of wood, or plate of metal, serving to connect the two end-pieces of the frame at bottom. H H represents the edge of a common table, to which the preas may be fastened by the iron screw-crams I I. K is a slit, of which there is one in each end-piece of the frame; these slits are filled with elastic flax, or other metallic filings, or with some other elastic substances which serve to prea the two rollers forcibly together. L is a brass bolster, supported upon the springs, and serving to support the end of the axis of the under roller.

Fig. 2. represents a side view of the rolling-prea, in which A B, A B, are the two end-pieces of the frame. D D, are the two rollers. E is the double-ended lever. G is a strong plank, or plate of metal, which forms the bottom of the frame. H H is the table on which the preas stand. I is one of the iron crams which fasten the preas to the table; and M is a bar of iron which connects the upper part of the frame.

Fig. 3. represents a screw-preas, which may be used, instead of the rolling-preas, in tracing off impressions from writings. A A is a double-ended lever. B B the screw. C a block of wood, or metal, which the screw acts upon, and which is attached to it. D D the frame of the prea, made of iron or wood. E E is a moveable board, on which the writing to be copied is to be laid, with a cloth over it. F F the bottom or side of the prea, made of wood or metal. Be it remembered, that these preas are made of different sizes, according to the sizes or largeness of the writings intended to be copied. Those now referred to are drawn from one sufficiently large to take an impression from a folio page of writing or print paper, and are drawn to a scale of one inch and a half for each foot, or one-eighth of their natural size.

Fig. 4. represents one of Hawkins’s patent polygraphs, for making two or more copies of any writing at once. A A B, is an upright frame, from the upper piece of which is suspended a double parallel ruler, D D, E E ; a o, c, is another similar parallel ruler, of which fig. 5. is a plan, fastened to the board, F F, of the instrument. These two rulers are connected to a short bar, G; the vertical one, D D E E, by pivots at the end of the bar, I, and another two pieces of brass, g g, at each end of G; and the horizontal one, d d, e e, by pivots at the ends of its corresponding bar, b, working in holes in another arm of the same brass. The pens are connected with the bar, G, by a curved brass limb, a, turning on a screw put through the bar, G, as a centre. On the other side of the bar is a short arm, b, in the same piece with the limb; this is joined at its upper end to the end of a small rod, b, the other end of which is joined to another exactly similar limb, carrying the other pen. The pens are fitted into a small tube, called the pen-tube, having a shoulder at its upper end. This fits tight into a other tube, in the same piece with the curved limb, and is pulled in as far as the shoulder of the pen-tube will allow.

The weight of the machinery is suspended by eight small spiral springs, I, fastened to a ring fixed to the bar, G; their upper ends are connected with the end of a double jointed lever, K, which can follow the motion of the bar, G, without stretching the springs too much. The rod, L, by which the perpendicular motion is suspended, turns upon pivots working in pieces of brass beneath the piece, B: the right-hand one is called a regulator, and has two screws, one moving the pivot vertically, and the other horizontally, for adjusting the instrument. The two bars, d d, of the horizontal motion are connected with d d, by pivots at the end of b, so that d d can be lifted up without moving the other, while weight is supported upon two small brass wheels t t. The frame, A A B, when the instrument is not in use, turns down on the board, F F, and is kept fast by a spring lock, which is opened by pulling in a round button, L. The frame now forms the sides, and the front board becomes the lid, and, when shut down, is locked by a lock, M. In explaining the use of the instrument, we cannot do better than copy the printed directions fold with the instrument. Choose two goose quills, taking care they are of the size wanted; make them into pens, and put them into the pen-tubes. Having introduced them with the nibs first, apply the shoulder of the pen-tube against the semi-circular hollow, in the upright part of the gauge, Q, fig. 4.; and pull the pen through the tube, till the nib reaches a line drawn across the end of the gauge; slide the pen-tube into the fixed socket, until the shoulder of the pen-tube lies flat; holding the fixed socket, and not by the work, as so not to jar the machinery. If the polygraph is in order, the pens will now write, draw, or copy whatever may be required, with the greatest exactness. To prove the machine’s being in order, bring the pens to the upper part of the paper, and try if they both touch; if not, with a small screw-driver turn the perpendicular screw of the regulator, till they touch equally. Bring the pens to the bottom of the paper, and move the horizontal screw till they both touch. When a pen wants mending, nothing more is necessary than to take the pen-tube out of the socket, mend the pen, gauge it, and return it into the socket again. When the machine is out of use, wipe the pens clean, and place the left one, with the curved limb, on the hook beneath the horizontal rulers. Let down the frame. A A B, which falls by a spring-lock, and at the same time has the writing-board, which then becomes the lid of the portable case for the polygraph.

The patent now belongs to Mr. Farthing, Cornwall, who manufactures the instruments.

These instruments are made with three, four, and five pens, and answer the purpose very well.

COPIVIST, in Diplomatic Science, signifies a transcriber or copyer of deeds, books, &c.

COPIVIST, a transcript of Major. Whatever improvements have been made in literary typography, no mue print
COQ

printed with types has equaled that of writing, engraving, or dampening. Rouilleau has extended this article to a greater length than seems necessary. It is indeed necessary for a copyist to know practical music well, and to be sufficiently acquainted with composition to avoid gross mistakes himself and detect them in others; to write a neat and legible hand; to know the Italian and French technique, to form all the characters in a bold and clean manner; and, by understanding the language of music, leaving no bar incomplete, by omission or redundance. These seem to be all the necessary requisites of a good copyist, if to them be added care and accuracy, particularly in forming a score, where quantity must be attended to in the exact arrangement of the notes over each other. Much has long been very neatly engraved in France, on copper; and in Holland, though less neat, with more force and distinctness: 60 or 70 years ago, the Dutch editions of the works of Corelli were much sought all over Europe; and 30 or 40 years ago, there was no music printed in Italy or Germany; all was MS. By which employment so many copyists obtained a livelihood, that it was thought a cruelty to shorten labour by the press; as in the first attempts at engraving Silk and cotton-mills. Works in literature, till the invention of the press, must have been disseminated very slowly by transcription; perhaps by the medium of the press, works of little merit, and of corrupt and vicious principles, have been too easily multiplied, and put in circulation. And indeed the cheapness has not been eventually the consequence of musical typography, dampening, or engraving; as printed music is now dearer than written was, early in the last century.

COPY-RIGHT. See Literary Property.

COQ, ad med. confumt., an abbreviation among Physicians, signifying that the thing is to be boiled till half of it be consumed.—Coy. in S. Q. Ag. implies it to be boiled in a sufficient quantity of common water.

COQUALLIN, in Zoology, the Scincus variegatus of Gmelin, and variegated squirrel of Pennant.

COQUANTOTOTL, in Ornithology, a bird of the warmer climates of America, described by Seba under this name: it is a small freckled-bird, shaped like a sparrow; the Pipra Grisa of Gmelin, the manicus crispatus griseus of Buffon, and the gray manakin of Latham.

COQUAR, the variety hybridis, of Gmelin's Phaisanus Colibiaca and the pied-pheasant of Haye's British birds.

COQUATOTOTL of Hernandez and Ray, the variety of Gmelin's Ampelis garrulus, the chat of Carolina of Edwards and Catesby.

COQUES, GONZALO, in Geography, a painter who was born at Antwerp in 1618, and became the disciple of David Ryckaert the elder. He soon gave proofs of extraordinary talents in small pictures; and the early friendship which he formed with the son of Ryckaert, whose name was likewise David, did not a little contribute to rouse his emulation, and quicken his diligence. His first essays, after the example of his master, were domestic subjects and conversations, in the manner of Teniers and Ofsade; but his admiration of the works of Vandyke, soon cauited him to adopt a style, in which the beautiful and picturesque grouping of his former models acquired additional interest, by being united to greater elegance and dignity of character. In this manner he painted a picture for Jacques Le Mercier, a rich merchant of Antwerp, which gained him great applause. It represented his employer with his wife and children at table: the painter himself was introduced in profile. From this period he devoted himself princi-pally to the painting of small portraits, which he executed with such delicacy and happy effect, that excepting Vand yke, no artist of his time enjoyed a greater reputation. He was employed by the court of Bruges, Charles I. king of England, and several other potentates. He died in 1684, leaving considerable riches to his family, etc.

COQUET, in Geography, a river of England, in Northumberland, which runs into the sea seven miles S.E. of Alnwick, at Hawksey, and is navigable for about 12 miles up to Warkworth bridge.—Alto, a small island of England, in the German ocean, about a mile in circumference, near the coast of Northumberland. It was taken by the Scots in the reign of Charles I. N. lat. 55° 13'. W. long. 1° 36'.

COQUETTE, a female character, no less contemptible than odious; against the iniquity of which Mr. G. Horne, in his excellent treatise, "On the Duties of the Female Sex," cautions his readers in the following decriptive and imprelve terms, "To delude a young man by encouraging his attentions for the pleasure of exhibiting him as a conquest, for the purpose of exciting the affections of another perfan, or from any motive except the impulse of mutual regard, is a proceeding too plainly repugnant to justice, and to delicacy of sentiment, to require much more

COQUILLADE, in Ornithology, the Alauda undata of Gmelin and undated lark of Latham.

COQUILLES, in Navigation, shells or moulds for bullets. They are made either of brass or iron. Two of them are required for the calling of a cannon-ball. And they never join or close so effectually, as to prevent the liquid metal when poured in from running somewhat out at the seam, where they join. This small part of the metal, or excellence of the bullet, is called the beard, which is broken or knocked off to make the ball perfectly round.

COQUIMBO, or VILLA SERENA, in Geography, one of the 13 provinces of Chili in South America. This is a rich, verdant fruitful valley, not far from the coast of the South Sea, producing corn sufficient for considerable exportation to Lima, and abounding with various mines. One mine of copper, situated about 5 leagues N. from the town of Coquimbo on mount Caro Verde, or Green Hill, rises to a considerable elevation in form of a sugar-loaf, and serves as a landmark to the port. The climate is singularly agreeable, being almost uniformly mild and serene.

COQUINO, or VILLA SERENA, the capital of the fore-mentioned province, was the second town built by Valdivia, in the kingdom of Chili, in 1544, for the purpose of maintaining an intercourse between Peru and Chili, in order to procure a regular supply, and to secure the fidelity of the Indians who lived in that valley. The town stands about 1/4 of a league from the sea in a most delightful situation, commanding an extensive prospect of the sea, a river of the same name, and the country, and presenting to view a charming variety of fields, with different kinds of grain and woods of a lively verdure. The town is large but not proportionably populous; the number of families not amounting to above four or five hundred, consisting of Spaniards, Mestizos, and a few Indians. The streets are conveniently wide, intersecting one another from north to east, and from east to west, as to form squares of buildings, with intervals for gardens. The houses are constructed with mud walls and covered with leaves, and each of them is provided with a large garden, planted with fruit trees and eucalyptus vegetables.
COR

vegetables. It has several parish churches, and three convents, and also a town-house, where the Alcaides and Regidores meet, who, with the corregidor, form the corporation. On the north side of the town runs the river; after flowing in various meanders through the whole valley of the same name; and, by canals cut from it, furnishes the town with water, which is principally applied to preserve the fertility and beauty of their gardens. The river at its mouth forms a very fine bay, where ships lie safely and commodiously, though the coast is rocky; some islands lying so as to keep off the winds. S. lat. 29° 52'. W. long. 71° 19'.

COR, in Geography, a town of Chiefne Tartary, in the desert of Cobi. N. lat. 44° 16'. E. long. 95° 29'.

COR, in Anatomy. See Heart.

COR, Fr. CORNO, Ital. in Moggio. A horn.

COR de Chaffe is a very long and instructive article in the Encycl. Metz; but the plates, to which the reader is frequently referred, not having yet published, the precepts for performing on the instrument, if translated, would not be intelligible.

COR, in Natural History. See Chama.

COR Caroli, in Afromony, an extra-conellated star of the second magnitude in the northern hemisphere, situated between the Coma Bremicenses and Ursa Major; so called by Sir Charles Scarborough, in honour of Charles I.

COR Hydra, a star of the second magnitude, in the heart of the constellation Hydra.

COR Leonis, or Regulus, a fixed star of the first magnitude, in the constellation Leo.

COR Sarp/li. See Antares.

COR Aquilum, in Natural History, a species of Echinus found only in a fossil slate.

COR Boeii. See Cardium Aculeatum.

COR Marinum, the name of one of the classes of the echini marini, the characters of which are, that the anus is placed in the side of that point of the shell which appears as if cut off; and the mouth has two lips, and is placed in the third region of the axis of the bale. Klein's Echin. p. 34.

COR Venus/is, Venus's heart. See Cardium Caridess.

CORA, in Ancient Geography, a town and Latin colony of Italy, in the country of the Volsci, according to Virgil, Silvius Italicus, and Livy; now Cori. This is a town of Latium on the left of the Appian way. S. E. of Velitrae. By its ruins we may conclude, that it was a place of importance; among these we discover a temple of Caior and Pollux, and an aqueduct for conducting water, &c. The ancient walls are still remaining. Allo, a town of Italy, situated in a promontory of Eturua. Justinus Liplius says, that in the passage of Tacitus which mentions it, we ought to read Cofa, which is not improbable.

CORAGE, Coragium, in our Old Customs, a kind of impostion extraordinary, growing upon some unusual occasion; and it seems to be of certain measures of corn; for corus tritici is a measure of wheat. Draccon, lib. ii. cap. 116. num. 6, who, in the same chapter, num. 8, has these words: "Sunt etiam quaedam communes prelaciones, quae servata non dicuntur, nec de confutatis ventunt, sed cum necessitas intervenerit, vel cum non venit; sicut non higidia, coragia, & caravagia, et alia plura de necessitate et ex contentu communi totius regni introducunt, &c."?

CORACA, or Corace, in Ancient Geography, a town of Arabia Petraea. Ptolemy.

CORACESIUM, a fortified place of Afa in Cilicia, according to Piny and Strabo; the latter of whom says, that it was situated on a rugged rock at the extremity of Cilicia.

CORACIAS, in Ornithology, a genus of the order, Pies, or Pies. The birds of this genus have the bill sharp at the edges, the tip incurvated, and the bare base of feathers; tongue cartilaginous and bifid; feet formed for walking.

The coracias genus comprehends only those birds which are known by English writers under the title of Roller, amounting altogether to between twenty and thirty species. In Latham's Synopsis it is observed, that the bill of the roller is straight, bending towards the tip, with the edges culvated; the nostrils narrow and naked; and the legs for the most part short, with the toes placed three before and one behind, the whole of which are divided to their origin. It differs from the corus, or crow tribe, chiefly in the nostrils being deftite of reflected bristles, and having the legs shorter. Brosson makes a particular genus of pies under the name of coracias, including those birds of the Indian genus corus which have the beak a little bent or arched. The coracies of the latest French writers, it may be likewise remarked, belongs to the corus genus both of Gmelin and Latham, as for example, the corus graculus (Corony chonh) and corus eremita (Hermis crow), &c.

Of the two last mentioned writers are referred to the coracias genus by the French.

The roller tribe is not confined to any particular part of the world like some other genera of birds, but the far greater number of its species are found in warm climates.

Only one species of the roller has been yet discovered in England, the garrulous roller, coracias garrula.

GARRULA. Blue, back r.d.; quill-feathers black. Linn. Fr. Sv. Common roller. Penn.—Donov. Brit. birds. Pica marina et garrulus argenteolus, Ray. Gallus, Brosson. Roller, Buffon. Gavia marina, Zimm. A beautiful bird, in size somewhat inferior to the common jay; the head, neck, breast, and belly are of a fine blueish-green, the back and scapulars reddish-brown; coverts on the sides of the wing rich blue; the tips of the quill feathers dusky above, beneath blue; the tail forked with the two middle feathers obscure green, the rest blue with the tip on the outer edge black; legs short and dirty yellow.

This species inhabits various parts of Africa, and Europe, but in greatest numbers in the warmer regions; in the north of Europe they are uncommon, in England very rare. It has obtained the name of garrulous roller in allusion to its chattering noise. The species is of the migratory kind, gregarious and timid, and builds in trees, particularly the beech. In the south of Germany it is seen in flocks in autumn, in company with the rooks and other birds feeding for worms, small seeds and roots, in tilled, or cultivated grounds.


Inhabits Bengal and the isle of Mindanao. Dr. Latham observes that it does not essentially differ from the following species, the chief difference being the fulvous violet colour on the breast, and the want of the long outer tail-feathers. The bengalensis, he thinks, may be perhaps the female or a young bird, as the long tail-feathers of coracias caudata do not appear till the second year. Lath. Gen. Syn.
In head claws down quills leffer back, rump, face exterior the legs the throat tail-feathers fcapulars, euus, Blue Blue-green Ceylon.

This is rather less than the common jay. The bill black; the whole space round the base of the bill white; head and under parts of the body, the upper parts of the wings, and tail, blue-green; shoulders and quills deep blue; the outer tail-feathers of great length as in the last species; hind part of the neck, and the back of a reddish-brown; the legs of a reddish-brown colour. It inhabits Ceylon and Senegal.


The bill of this bird is black; tip of the upper mandible much bent; sides of the head from the nostrils to a little beyond the eyes are white; the rest of the head, neck, and under parts of the body fine green; the two middle feathers of the tail are dull, with a gloss of blue, especially down the middle, the outer ones blue-green; the two exterior tail-feathers are six inches longer than the rest, and the end, beyond the extremity of the others, of a fine deep blue; the legs are red-brown. A native of Abyssinia.


A native of the East Indies. Its size is that of a jay, the length ten inches and a half; the bill yellowish, broader at the base, and more hooked than in any of the genus; the head and hind part of the neck brown; back, rump, and scapulars, with the wing and tail-coverts, green-brown; throat fine blue; down the shaft of each feather a pale line, the other parts beneath blue-green; quills blue and black, with a large pale blue spot. The wings are longer than in the other species of roller; the tail even at the end, the two middle feathers green at the base, with the other part black; legs yellowish with black claws.


The length of this bird is eleven inches. The bill is dull, an inch and a half in length; the crown of the head blue-green; throat, breast, neck, and back, reddish brown, with the sides of the head and throat darkred, streaked with white; rump and tail, with the under parts from the breast, fine cuneate blue; the middle feathers of the tail green, the outer ones blue at the bottoms and tips, in the middle sea-green; the wings green and blue. A native of Ceylon.

Ceylana. Blue, exterior edge of the quill-feathers pale yellow. Linn. Cape roller, Lath. Inhabits Ethiopia; an obscure species described on the authority of Linnaeus.


Length of this species eight inches; the bill dully. Native place unknown.


A beautiful species found in Madagascar. The length of this bird is ten inches; the bill is very stout at the bars, rather short and pointed. The yellow colour; the legs reddish-brown. Magicana. Reddish-grey; beneath and on the wings pale grey mixed with flame colour. Gmel. Galalgus magicanus, Buff. Merula magicana, Schb. Rollier des Magica, Buff. Mexican roller, Lath.

Larger than a thrush, and inhabits Mexico.

Pueila. Blue, collar in front, and at the side, with the breast, belly, quill-feathers, and greater wing-coverts black. Fairy roller, Lath.

Size of a blackbird, and inhabits India.


The length of this bird is eight inches. The female cerine-grey and not streaked like the male; quill-feathers black, edged with cerineus; iris pale red. A native of New Caledonia.


Inhabits China, and is called at Canton Sau-ta-hoang.

The size is that of a jay; the length eleven inches and a half; the bill and irs are red; head, and hind part of the neck, back, rump, and upper tail-coverts green; through the eyes on each side is a black stripe; the under parts from the chin to the vent yellowish-white tinged with green; wing-coverts olive-brown; quills the same with a mixture of chestnut in some, and others tipped with white; the tail resembles that of a magpie in form, and is marked at the tip of every feather with a white spot; the legs and claws are pale red, and longer than in other rollers.

Vagabunda. Head and neck black; body above ferruginous-brown, beneath cerineus; middle of the wing white; tail very long, wedge-shaped, greyish with the tip black. Lath. Grey-tailed roller, Lath.

This is a native of India; the length is seventeen inches; its bill black; legs cerineus; lesser wing-coverts rufit brown; greater and secondary quill-feathers white, the primary ones black.

Cayana. Tawny-green; beneath dirty white; eyelids white; chin with a black streak each side; tail cuneated. Gmel. Griviert, ou role de Cayanne, Buff. Cayanne roller, Lath.

Inhabits Cayenne, and measures about nine inches in length, the bill is reddish; legs long and grey.

Dociolis. White interpersed with reddish; beneath chestnut; legs pale yellow; tail-feathers black with the tips white. Gmel. Dociole roller.

Size of a blackbird, and inhabits the southern parts of Asia. The bill is yellow; the nine first quill-feathers white as far as the middle and from thence black, the rest entirely black; claws flesh colour.


Length sixteen inches; bill thick, and with the legs black; tail seven inches. Native country unknown.

Atra. Tesselaceous red; beneath reddish-purple; vent blue-green; wing and tail-feathers blue, with the tips blackish. Gmel. African roller, Lath.
Length eight inches and a half; the body stout, bill yellow; legs brown. A native of Africa.

Melanoccephala. Blue-purple; head and neck black; body beneath white; quill-feathers fuscous; tail emaciated and white at the tip. Gmel. Black-headed roller, Lath. Size of a crow, bill and legs red; nape pale grey; two middle tail-feathers blue, the rest purplish, and the whole white at the tip. Inhabits China.

Strepera. Black; foot on the wings, vent, base, and tip of the tail black. Lath. Noisy roller. This is an inhabitant of Norfolk island in the Pacific ocean, where it occurs in vast numbers; it has the reputation of being a sly bird, and is very noisy in the night. The length is nineteen inches, of which the bill is two inches and a half long, somewhat straight, black, dentinate, and horn-coloured near the tip; multiris naked, long, and placed near the base of the bill. The first six quill-feathers are white at the base; the tail long and rounded, the larger feathers white at the base, the lateral ones white at the tips within. When the wings are folded they reach as far as the middle of the tail. The legs are black, the outer toe connected at the base to the middle one.

Varia. Black; beneath, lower part of the back, rump, and upper tail coverts white; tail black, equal, with the tips of the feathers white. Gmel. Caucaecus de la Nouvelle Guinee. Buff. Pied roller, Lath. Length about thirteen inches; the bill two inches and a half long, and of a blueish colour with the tip dark; legs lead colour. A native of New Guinea. This bird partakes of characters common to the oriolus, coracias, and ramphastos genera, and might with some propriety be referred to either. In the index ornithologicus it is placed with the coracias tribe.

Coracinsil, in Ancient Geography, a people who inhabited the northern part of the island of Sardinia. Coracinsus, in Ichthyology, the name of a fish-fish caught in the Mediterranean, and called by some authors fesvum, and by Aldrovand and Salvian umbra. It is of the colour of the common tench, but in figure more approaches to the perch: its scales are small; its mouth not very large, but well furnished with teeth; and its tail is not forked, but when extended, seems of a roundish figure; the ends of the rays or nerves of the tail-fin are black, and the other fins are all black, and feen as if dyed with ink.

Coracinsus Brasiliensis, the Labrus Cromis of Gmelin, and Guatunca of Margrave. Found in Carolina.

Coracius Mons, in Ancient Geography, a mountain of Asia Minor in Jonia, situated near the town of Colophon. Strabo.

Coracle, a fishing boat of curious construction used in Wales for time almost immemorial. These boats afford a specimen of the earliest British navigation, and they are used at this time on many of the rivers in Wales, probably without any deviation from their original form. They are made with very strong basket-work, and covered with hides, or coarse canvas, with a thick coating of pitch. Their shape is oval and resembles the figure of a walnut-shell, their length is generally five feet, and their breadth seldom less than four. They contain only one person, who fits precisely in the middle, and by dextrous management maintains his just balance. The instrument with which he moves his boat is a paddle; one end of which rests upon his shoulder, and the other is employed by his right hand, in making a stroke alternately on each side. The left hand is, in the mean while, employed in conducting the net, and he holds the line between his teeth. These vessels were anciently used, as the means of intercourse between the inhabitants on the opposite banks of the rivers. They are now applied only to the purpose of fishing. So frail an invention would probably have been exceeded by something of greater strength and capacity, had not there been found a remarkable convenience in their lightness. The fisherman, when his labour is finished, flings his boat across his back, and marches homewards under the burden of his machine and booty. There is scarcely a cottage in the neighbourhood of the Tywi in South Wales, or several other rivers in those parts, abounding with fish, that has not its coracle hanging by the door. Such is the adroitness of those who use them, that they are very rarely overturned on lakes or rivers; and they sometimes even venture a little way out to sea, when the weather is perfectly calm. Similar to these in their nature are the Indian canoes; though they are constructed of different materials and forms, and applied to different purposes.

Coracobrachialis, in Mythology, a muscle of the shoulder-joint, arising by a tendinous and fleshy origin from the apex of the coracoid processes of the scapula, and connected for some extent with the short head of the biceps. It passes downwards and backwards, to be inserted into the inner side of the os humeri about the middle of the bone. The musculo-cutaneous nerve generally penetrates the fibres of the muscle; whence it has been called the musculus perforatus Caffrinii. It will move the os humeri towards the side; it will elevate the bone, and carry it obliquely forwards across the front of the chett. It may rotate the os humeri outwards, particularly if that bone has been previously turned inwards.

Coracodes, in Ancient Geography, a port of the W. coast of the island of Sardinia. Ptolemy.

Coracothyoides, in Mythology, a term applied to the omomydous muscle, for which see Larvix.

Coracoides, in Anatomy, a small sharp processes of the scapula; so called from its resembling a crow's bill.

The word comes from corax, corvus, and vertic, image.

The coracoides is placed in the upper part of the neck, and projects over the head of the bone of the arm. It serves to strengthen the articulation of the shoulder; and gives origin to one of the muscles of the arm.

Coracomantes, from corax, corvus, and nutus, divination, in Antiquity, a kind of diviners, who made their predictions by observing the crows.

Coraconesus, in Ancient Geography, an island of the Mediterranean sea, towards the coasts of Libya. Steph. Byz.—Alfo, a place of Peloponnesus, in Arcadia; situated, according to Pausanias, where the river Ladon discharged itself into the Alpheus.

Coracoradalisis, a name given by Winlow to the beices flexor cubiti. See Biceps.

Coradi, or Curadi, Ottavio, in Biography, a Bolognese painter, the scholar of Giacomo Cavedone. His principal excellence consisted in the boldness and truth with which he copied the works of his master. He flourished in 1670, and is said by Pilkington to have died in 1643. Malvatis, Orlandi.

Corah, or Corah Jensenabad, in Geography, a small city of Hindooistan, or capital of a province in the Doob, or country between the rivers Ganges and Jumna; subject to the nabob of Oude: 184 miles S.E. of Agra, and 67 S.S.W. of Lucknow. N. lat. 26° 10'. W. long. 80° 50'. When lord Clive assumed the government of Bengal, in 1765, he restored to Sujah Dowlah all the conquests that had been gained from him, except the provinces of Corah and Allhabad, which were reserved as part of an establishment for the emperor, or great Mogul. The Corah provinces were valued at 50 lacs. The emperor was to reside at Allhabad, under the protection of the English, to whom,

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in reality, he owed all that he possessed, and a treaty offensive and defensive was entered into with Sushis Dowla, the nabob of Oude. The ambition of the emperor was not satisfied; but after about six years quiet residence at A lahabad, he put himself into the hands of the Maharrattas, who promised to set him on the throne of Delhi. The immediate consequence of this connexion was a cession of the Corah provinces to the Maharrattas, who, unlike the English had interposed, would have established themselves in that important angle of the Doab, which commands the navigation of the upper part of the river Ganges, and the whole course of the Jumna. On this occasion, the British government considered the Corah, &c. provinces, which, by right of conquest, were originally theirs, as having reverted to them again, when they were alienated from the purposes for which they had been originally granted to the emperor; and applied to the aggrandizement of a power irremediable to them and their allies. They, therefore, refusing the possession of these provinces, and immediately ceded them to the nabob of Oude, for a valuable consideration. See Oude.

CORAL, in Botany, arbor non spinosa; Pet. Rai. See Erythrina crista-galli.

Corallaria affinis; Sloam. See Sophora occidens- talis.

Corallus maritimus; Com. See Erythrina corallo- dendron.

Corallus sericea; Dill. See Erythrina herbacea.

Corallus polyphylla; Sloam. See Piscidia erythrina.

Corals in Zoology, a general English name for zoophytes of the lilius tribe, or those which animal resembles a plant, and have the plant form and articulate; with the joints longitudinally divided, united by spongy or conicous junctures, and covered by soft porous cellular flesh. About six species of this curious genus are at present known. See lis.

Corals, red, or true red coral, was considered by Linnaeus as an isis, and arranged as such in the Systema, though Linnaeus himself acknowledged to Mr. Ellis, the author of the Natural History of Zoophytes, that the latter had more properly classed it with the gorgonia, or sea-fan, the genus isis being sufficiently distinguished by its jointed item. In the last edition of the Systema, the coral is placed with the sea-fans, or gorgonia.

The red coral grows in an expanded and somewhat flattened form, with dichotomous branches, that lessen towards their extremities. The flesh is of the colour of red lead, or inclining to vermilion, soft, slippery, and full of minute vessels. The mouths are placed on the surface, and rise up in a conical form, confluent of eight valves, just opening, from whence proceed papules of a white colour, with eight claws, each of which has a double fibre at both edges. The bone itself, dissected of the flesh, is the true coral of the thinus, and which, in its natural state, is of a fleshy texture, and of bright red colour, with the outside marked with minute furrows, or irregular divisions, interspersed with a few slight depressions, corresponding with the situation of the shells, before the flesh be removed. For a further account of this curious article, see Gorgonia publilis.

Corals, black. In the Linean system, the true black coral is described as pertaining to the same genus of zoophytes as the red kind, under the specific name of antipathes. This fact is found on the shores of the Indian and Mediterranean seas, and grows in a shrubby form to the height of about two feet, with the branches erect, and alternately pinnate. The bone is of a black colour, marked on the outside with flaxen flax, and in its native state is covered with flesh of a grey colour. See Gorgonia antipathes.

The gorgonia antipathes, or true black coral, must not be confounded, from the similarity of names, with the antipathes genus, the latter being very distinct, although its species are not unfrequently denominated black corals, as well as the gorgonia before-mentioned. There is a great affinity between the antipathes and gorgonia genera; notwithstanding which they may be readily distinguished, the bony part of the antipathes being bexet with small spines, and covered with gelatious flesh, and numerous polyple-bearing tubercles, while the bone of the gorgonia is smooth, or delittle of spines, and the flesh cellular.

From the old botanical writers it appears, that many of the zoophytes were considered as genuine plants; and that in particular several sorts of black corals were formerly called antipathes. But as the characters of these marine bodies are better understood in the present age, only part of these have been retained in the genus antipathes, and some of the rest referred to the gorgonia. The antipathes of certain kinds were formerly used as feepes for princes, and likewise for divining rods, and other similar purposes, as in evident from the remarks of Salimania, addressed to Solinus, wherein he says, that antipathes denotes something proper to reflect incantations, and that they were in use for that purpose by several Indian nations.

There are a number of different species of this kind of black coral, which, not being sufficiently noticed under the article antipathes, it may be proper to describe in this place.


This kind inhabits the Indian, Mediterranean, and North seas. It is of a hard and honey black substance, extremely brittle, and varying in length and thickness; one described by Mr. Ellis measured two feet long, and was about the thickness of a writing-pen; another, not thicker than the bane of a quill's feather, was about seven feet in length. In its natural state this kind is variously twisted, or generally in a spiral manner; and the leaf which covers the spiny surface of the bone is full of little gelatinous warts.


A native of the Indian ocean. This kind is full of small short spines, the branches are loose and irregular, and the whole remarkably black. The specimeen brought from Batavis, and described by Mr. Ellis, had the surface marked with ovate cavities, differing about the branches, which were of a brownish-yellow colour, and supposed to be the ova-

Subpinnata. Branched and pinnate, rough with feta-

cuous alternate sub-divisiones, and a few others proceeding transversely from them. Soland. and Ellis.

Described by Gmelin as a native of the Mediterranean sea on the authority of Ellis, who, however, merely informs us his specimeen was brought from Gibraltar, and is supposed to be taken in the sea therabouts. The spines of this kind are long and small, and of an amber colour when magnified. The surface of the antipathes appears to be cinerenous.

Myriophylla. With numerous, incurved, pinnate branches, the subdivisions with long spines pinnules on the upper side. Soland. and Ellis. Myriophyllum indicum venetum, Petiv. Ericca marina, tenuis, Rumpf.

This is called by Ellis the yarrow-leaved antipathes; it is a beautiful shrub-like appearance, with many pinnated branches, bending downwards all round; the colour ye-

lowish-
Coral

lowish brown, and the surface rough, but considerably less so than the species subprimata. Found near the Spice islands.

*Allopecuroides.* With spinous, fetaceous, closely panicked branches. Soland. and Ellis. *Fox-tail antipathes.*

The trunk of this species rises from a broad spreading base, and divides immediately into several large branches, of about one-third of an inch in diameter. As they rise up, one side of them appears flat, with a groove or channel along the middle of it, where there are the remains of many little branches that have grown in rows on each side. It then divides into branches, and often into other branches, all which are in form of close panicles, not unlike the fox-tail graps. Thse panicles are composed of very rough thorny minute branches, which are twice as long on one side of the stem as the other. This rises to the height of two feet, and is of a greyish colour on the outside, the inside black and very brittle. A rare species, discovered on the coast of South Carolina.


The cyprès antipathes was erroneously called by Linnaeus with the gorgonia; Gmelin places it with the antipathes. The species inhabits the Indian ocean; it is about two feet in length, and is covered with a brownish-down, beneath which the colour is deep black.

*Dichotoma.* Very long, dichotomous, and upright. Pallas.

Inhabits the Mediterranean, is about two feet in height, round, and dusky.

*Oricalcea.* Brassy, smooth, with a simple, rigid, flexuous stem, and alternate, scattered, dichotomous branches. Pallas. *Gorgonia ena,* Linn. Twelve inches in length, and very rigid. A native of the Indian ocean.

*Clathrata.* Very much branched, intricate, with confused sub-divisions in every part coalescing, the younger ones fetaceous. Pallas.

Size of the leaf, and of a black colour within: this inhabits the Indian ocean.

*Flabellum.* Dilated, very ramose, and sub-divided, the sub-divisions branching both ways, and cohering together in a reticulated manner. Pallas. *Erica marina affinis,* Rumph. This kind inhabits the Indian sea, and is about six inches wide, black, rough, and uncuriously curved.

*Pennacea.* Branched, somewhat incurvated, the branches with fetaceous and very crowded rough sub-divisions. Pal. *Accabat ruturutura,* or *Erica marina crassa,* Rumph. *Fusilus pristus,* Adir.

Inhabits the Indian ocean, the outside grey and rough, within black.


*Poeniculacea.* Very much branched, with fetaceous decompound sub-divisions. Pallas. *Fenus marium,* Rumph. Twelve inches high, the colour black. A native of the Mediterranean.

*Coral, subtile.* See *Madrepora,* *Millepora,* and *Cellepora.*

Coral gives title to an official composition, called *jiyub of coral,* sometimes preferred by physicians; as is lik wise the powder of coral finely ground, and afterwards levedgated on a marble, and made up into a proper form. But there are few, except those who are fond of medicines with gems in them, that make use of it. By means of its exceeding hardness, it is supposed to take away with it a great deal of the levigating done.

Dispensary writers have given us receipts for a great many preparations of coral, as magisteries, tinctures, salts, &c. none of which enter the present practice.

Coral and coraline being the shells of marine animals of the polype kind, possess the same chemical properties as the fresh shells of oysters and other shellfish, i.e., they are calcareous earths impregnated with some animal principles. *Coral, artificial,* is made of cinnabar well battered; a layer whereof is applied on a piece of wood well dried, and polished, first moistened with size; the whole is then again polished; and for varnish, rubbed over with the white of an egg. See *Grotto.*

*Coral, filfery.* The time for fishing coral is from April to July; the places are the Persian gulf, the Red sea, coasts of Africa towards the ballion of France, the isles of Majorca and Corfica, and the coasts of Provence and Cata-

The method of fishing is nearly the same in all places: that used at the ballion of France, where there is an established fishery, under the direction of a company at Marseille, is as follows.

Seven or eight men go in a boat, commanded by the patron or proprietor; the caftle throws his net, if we may so call the machinery wherein he uses to tear up the coral from the bottom of the sea: and the other, as he manages the boat. The net is composed of two beams tied across, with a leaden weight to press them down; to the beams is fastened a great quantity of hemp loosely twisted round, among which they mix some flagon nets. In this condition the machine is let down into the sea; and when the coral is pretty strongly embarrassed in the hemp and the nets, they draw it out by a rope, which they unwind according to the depth, and which sometimes requires half a dozen boats to draw. If the rope happen to break, the fishermen are in great danger of drowning. They have two machines, one for fishing up the coral where the bottom is smooth; and the other, called in the Provençal language the *salabre,* so constructed as to be employed where the bottom of the sea is rocky and unequal.

Before the fishermen go out, they agree on the price of the coral, which is ordinarily at the rate of 4. 6 d. per pound.

When the fishery is over, which in a season usually amounts to twenty-five quintals of coral each boat, it is divided into thirteen parts; the patron whereabouts, or master coraller, has four, the enter two, and each of the six companions one: the thirteenth being reserved for the company, &c.

Spallanzani has particularly described the coral fishery in the isles of Minor. (Travel in the two Sicilies, &c. vol. iv, p. 519.) This, he says, is both a laborious and dangerous occupation. The instrument, with which they force the branches of coral from the rocks, is formed with two poles of wood, crossing each other at right angles, and having a piece of a net fastened on the under side to their extremities. A large stone is fixed where the parts cross each other, that the instrument may more readily sink to the bottom. A cord is strongly tied round the middle of it, one end of which the fisherman holds in his hand, guiding by it the net to those places where the coral is supposed to grow: and which is enclosed, in the pieces of the net, broken off, and drawn up. This fishery

4 X 2
is carried on from the entrance of the Faro to the part of
the strait opposite to the church of the grotto, or through
a tract six miles in length, and to the distance of three
miles from Messina. The rocks which produce the coral are
situated almost in the middle of the strait, at different
depths, from 330 to 650 feet. The bottom and caverns of
the rocks are the places from which they endeavour to
bring up the coral with their nets; and it is a constant
observation, that every branch is perpendicular to the plain
on which it grows, without ever turning on one side.
Coral, it is said, grows more plentifully in places situated
to the ca11 than in those to the south; it is rarely found to
the well, and never to the north. In the first situation it
is larger, and of a finer colour, than in the second and
third; which two valuable qualities are likewise found in
which is brought from a less depth, compared with
that which is grown at a greater. The greatest height to
which it grows is never a foot, and its usual thickness is
that of the little finger, and somewhat less than that of the
rocks of Trapani and Barbary; but the latter are exceeded
by the Mellinefe in vividness of colour. These differences,
according to the account of the fishermen, arise from their
oral being produced in a sea which is kept in continual
agitation, from the surface to the bottom, by the current
and the winds. With respect to colour, there are three
kinds; the red, the vermon, and the white coral. The
first is subdivided into the deep crimson-red, and the
lighter red. The vermon is extremely rare, but the
white common. In the white they include the clear white
and the dull white.
The coral fishermen have divided the whole tract in
which they fish into ten parts. Every year they fish only in
one of these parts, and do not fish in it again till ten years
are elapsed. This interval of ten years they think necessary
for the coral to acquire its full growth in height and
profusion. When they transgress this law, they find, in fact,
the coral smaller, and of less confidence, and the intensity
of the colour is always in proportion to the number of
years they have deferred from fishing. When the ten years
have elapsed, they believe that the coral no more increases
in height, but only in thickness, which, however, has its
limits. In fact, they have observed that the coral filled
up near San Stefano, a place where none had been fought
for in the memory of man, though it was of a very bright
colour, was not higher than the ordinary coral, though it
exceeded it by one-third in thickness.
The number of ships which usually go together in this
fishery is eighteen or twenty, each of which is usually
managed by eight men. The quantity of coral procured
may amount every year to twelve Sicilian quintals. The
quintal, as is well known, contains two hundred and fifty
pounds, and the pound twelve ounces. The gain acquired
is therefore adequate to the labour; yet may the fishery be
considered as a secondary occupation, since the fishermen
only follow it when they have no other employment by
which they can make a greater profit. Spallanzani exa-
nined the branches of coral, as they were taken out of
the nets, by putting them into glass vessels filled with sea-water.
It is well known that, in this cafe, the white polypi will
come out of their cells in the coral as soon as the water
is perfectly at rest. He examined and re-examined
these polypi, as it was the first time he had seen them;
but he discovered nothing which can make any addition to
the accurate observations of Peydelfon, Jullien, Guettard,
Donati, and the very recent remarks of the celebrated
Cavolini, which seem to leave nothing to be desired to
complete our knowledge of these animalcula, and their na-
tural habits. Having made some additions and correc-
tions to the observations of count Marigli, relative to this
subject, he proceeds to describe the principal of those
branches, which now make a valuable addition to the clas
of Zoonphyta in the imperial museum at Paris. He observes,
That the bark of this branch has the colour of sealing wax;
but the solid coral is purple, with some transparency at
the extremity of the branches.
2. The bark in colour resembles that of the foregoing;
but the included solid coral is of a less vivid red.
3. The bark is of a bluish grey; the solid coral grey,
with a slightly reddish tinge.
4. In this specimen four branches shoot from the same
item; two of a pale red in the bark, and a whitish red in
the solid coral. In the fourth the bark is of a whitish
colour, and the solid coral still whiter.
5. Three branches joining in one, the colour of
which, both in the bark and the solid coral, is a milky
white.
With respect to the structure of the cortical and solid parts
of the white corals, he observes that they are the orifices
of the cells in the bark of the white coral, which being oöter-
derated like those in the red, appears to be a proof that
the polypi in both are of the same structure, and conse-
quently of the same species; the polypi inhabiting the
red coral having likewise eight tentacles. That coral is
soft in the sea, but hardens when it comes in contact with
the air, was the opinion of the ancients; but has been
proved false by the observations of the moderns. The
coral-fishermen of Messina, who derive all their knowledge
from experience only, are convinced this opinion is erro-
nous; but they assert that coral which has not attained
maturity has not that degree of confidence it acquires
when it has arrived at its full growth. The truth of this
position Spallanzani was not able to ascertain, as, for that
purpose, it would have been necessary to call the net in
one of those ten parts of the strait in which it is pro-
hibited by the law to fish till the expiration of the ten
years prescribed. Yet the rules of analogy derived from
what is observed in all animals and vegetables, inclined him
to favour this opinion. It is agreed however by the fisher-
men on the coasts of Barbary, and also by those of Messina,
Sardinia, and Corfìca, that the deeper they descend into
the sea, the smaller is the coral. Donati observes, that
the broken and detached branches of coral will continue to
live and multiply in the sea; and this Spallanzani allows to
be the case, provided they meet with a firm point of sup-
port to which they can attach themselves with their various
humour. Otherwise, if they fall on the movable sand,
they become the sport of the waves, and he has no doubt
but they must perish. The fishermen, with whom Spallan-
zani conversed, appeared to be well acquainted with the
true generation of coral; as they told him that they had
frequently observed, on hard matter drawn from the bot-
tom of the sea, the first principles of coral beginning to
germinate, which they describe as having the appearance of
a red spot, with a button or bud implanted in those mat-
ters, sometimes tender and fragile, and sometimes hardened,
and of the colour and nature of ordinary coral.
They were likewise acquainted with those branches of
coral which, when filled up, are sometimes found perfor-
ated by lithophagous worms, and which are mentioned by
Vitaliani and Marigli. Their nets had frequently brought
them up, either from the bottom of the sea, from ca-
verns, or the sides of rocks; and these perforated corals
were found sometimes broken in the trunk, where the per-
forations
formations are most frequent; and at other times attached to some body which formed them as a vase. They were of opinion that these corals were thus perforated, because they were dry; and this dryness, they imagine, proceeds either from age, or their having been broken from their roots by some wind, or by a part of a rock falling on them; or possibly by the coral nets, which do not always bring up all the branches of coral they tear away from their roots.

_Coral islands_, in Geography, called by the Spaniards in their old charts _las corales_, or _jiles del coral_, three islands lying in the form of a triangle and situated S.W. of the Lazardron, in the East Indian ocean.

_Coral river_, a river of New Mexico which runs a W. by S. course and discharges itself into the head of the gulf of California, near the mouth of the Colamero river.

_Coral-tree_, in Botany. See _Erythrina Corallo-bendium_.

_Coral-curr._ See _Dentaria Bulbifera_.

_Coralaria_, _parvifolia_; Rumph. See _Adenanthera Pavonina_.

_CORALIS_, in _Ancient Geography_, a marsh of Asia, in Lycaonia, placed by Strabo in the vicinity of Galatia.

_CORALIUS_, a river of Greece, in Buxotia.

_CORALLA_, a place of Asia, in Cappadocia, on the Euxine sea, according to Arrian's Periplo.

_CORALLI_, a people of European Sarmatia, who inhabited the banks of the Euxine sea, towards the Danube.

_CORALLINA_, in _Zoology_, a genus of zoophytes, the animal of which is a plant-like form, with the stem fixed, and the branches subdivided, calcareous, and mossy joined.

The ancient naturalists millook corallines for a particular tribe of plants, and accordingly introduced them into their works under the title of marine mosses. Tournefort enumerates thirty-six species among his plants; and indeed certain kinds appear to be so nearly allied to the lichen family, that some continental botanists, even in the present day, are in doubt where to draw the exact limit between the cryptogamia and the corallina.

All the corallines adhere to rocks or other solid bodies, and are concretions formed by the polype animals which inhabit them, the coralline itself being only the habitation of these creatures. The branches are commonly elevated, of a shrub-like form, and exhibit an elegant appearance from the symmetry and general proportions of their respective articulations; the branches being composed of little joints, like beads strung in a necklace. The joints consist of a calcareous and gelatinous matter, and have the surface perforated, or full of minute pores, which in many species are so very small as to be visible only with the aid of glaesses. It is in these minute cells that the polyps reside, and through which they either protrude their limbs when they lie in wait for food; or draw their nourishment through the aperture. When a branch of coralline is immersed in vinegar the calcareous crust dissolves, and leaves the cartilaginous parts uninjured, and by that means enables us to examine its internal tubular structure. In point of colour the corallines differ very considerably, not only in different, but also in the same species, and without exception the whole become white on exposure to air.

The coralline tribe, possessing much elegance and beauty, are highly ornamental in a collection of natural history; one species only appears to be appropriated to an useful purpose, which is the corallina officinalis, vail quantities of which are gathered and employed in medicine as an abortive.

Among the older writers the word coralline had a very general acceptance, and seems to have comprehended every description of polype-bearing sublittines, in addition to the coralline genus of modern naturalists, such as the _tubipora, fragmentaria, cælata, fideola, alethium_, &c. Mr. Ellis, in his publications on corallines, adheres rather too closely to this idea, but still defines the several genera with so much accuracy as to render his works of the greatest value to future naturalists. His vesiculated, tubular, calciferous, and articulated corallines are referable to the different genera above-mentioned (which see respectively). He includes also among his corallines the _cæsia_, _gorgonia_, and _patch_. &c. in which he is certainly wrong. The species of the true corallina at present known are as follow.

Species.

_Tridens._ Trichotomous, with compressed three-lobed flat joints. Ellis.

Found on the coast of the North American islands, where it was first discovered by Mr. John Greg.


This kind grows on the coast of Jamaica, and other West India islands, and is found also in the Mediterranean sea. The colour is white, and the joints somewhat kidney-shaped.

_Monile._ Trichotomous, with the lower joints compressed, convex, cuneated, oblong, and with the upper ones sub-cylindrical. Soland. and Ellis. Flethy coralline.

_Incrassata._ Trichotomous, with compressed plano-convex wedge-shaped joints. Soland. and Ellis. Flethy coralline.

This kind is very frequently called up on the shores of the American islands, particularly Jamaica.

_Tuna._ Trichotomous, with compressed flat roundish joints. Soland. and Ellis. _Tuna corallina_. _Opuntia marina_. Park. Thesat.

_Found in the Mediterranean sea._

_Nodulata._ Trichotomous, and very much branched, with thick wedge-shaped joints, those at the divisions broadest, the terminal ones tricuspidate or ovate. Pallas. _Nodularia alba_. Imp. _Moseus corallides_. C. Bauh.

Inhabits the same seas as the preceding. Grows to the height of eighteen inches, and is very thick, strong and white.

_Squamata._ Trichotomous, the joints of the stem roundly compressed and wedge-shaped, those of the branches flatly compressed; terminal ones flattish and sharply two-edged. Ellis.

Inhabits European coasts, and is of a sea-green colour.

_Loricata._ Trichotomous, with compressed, sub-convex, wedge-shaped joints, angulated at the sides; the terminal ones with small obtuse lobes. Ellis.

A native of the Mediterranean sea.

_Palma._ Trichotomous, with compressed, sub-convex, wedge-shaped joints, slightly denticulated at the tip; the extreme joints broad, and often furnished with short finger-like lobes. Ellis.

This was found in the American seas, and is of a glossy white colour.

3

_ELONGATA._
ELONGATA. Trichotomous, with the joints of the stem roundish and cuneated; those of the branches cylindrical; the extreme joints a little obtuse, and some of them capitated. Ellis.

Varies in colour from red to purple. It inhabits the European coasts.

SUBULATA. Trichotomous, with the joints of the stem cuneated and two-edged, and projecting small pointed branches from the top of each of their sides, with round joints. Ellis.

The appearance of this coralline is very flat, white, slender, and small, and seems as if it were very closely pinnated or bifurcated with fine white fibres, projecting out on each side like the plume of a feather. This is the most delicate of the coralline tribe. Found in the West Indies.

Granitera. Trichotomous, with the joints of the stem compressed and wedge shaped; those of the branches roundish, and furnished with opposite ovate ovaries, seated on small pedicles. Ellis.

This differs from all the other kinds of trichotomous corallines, in having proliferous ovaries, or branches growing out of them, being other ovaries. It is of a fine slender texture, and of a sea-green colour. It was found on the coast of Africa, in the Mediterranean sea.

OFFICINALIS. Sub-bipinnate, and usually trichotomous, with the joints of the stem somewhat cuneated or turbinated; those of the branches round, and some of the terminal ones capitated. Ellis. Corallina officinalis, sub-bipinnata, articularis fusciturbinata, Linn. Fl. Suec. Corallina officinalis, Toberaen herb. Mysurus constrictus, Barrel.

Common on almost every shore, where it grows on the rocks in tufts of two, three, or four inches in length, and varying considerably in colour, being red, yellow, green, and white. This is the coralline of the shops, and is the kind used in powder as an abr.-rubent.

Pinnata. With pinnated branches without joints, and covered with a mealy substance. Ellis.

Found on the coast of the Bahama islands.

Ruby. Dichotomous, filiform, with the joints of the stem round; those supporting the divisions elavated, and some of the lower ones bicornuted. Ellis. Corallina rubens, Linn. Corallina filiformis dichotomata sufflata, articularis omnibus cylindris, Pallas.

Inhabits European seas; length two inches; colour red.

Crystata. Dichotomous, filiform, in crested clusters, with roundish joints; those supporting the leaf sub-divisions elavated. Pallas.

This kind inhabits the European and American seas. The colour, as in officinalis, varies from red to purple, green, yellow, and white.

Fractiissima. Dichotomous, with smooth, even, cylindrical joints; those at the extremity broadest at the tip. Linn. Corallina minimum capitaceum, Sloane.

This is found in the West Indian and Mediterranean seas, and is so extremely fragile, that perfect specimens are very rarely obtained; the colour is milk-white; length about two inches.

Spermophorus. Dichotomous, filiform, with roundish branches; those supporting the two last sub-divisions elavated. Linn., &c.

Inhabits European seas, is of a milk-white colour, and about an inch in length.

Corniculata. Dichotomous, with the joints of the stem and branches bicoromuted; those of the subdivisions roundish. Linn.

Inhabits the same seas as the preceding.

FRUTICULOSA. Dichotomous, with round branches tapering towards the extremities, without joints, and mealy. Ellis and Soland.

There are many varieties of this shrub-like coralline; the species occurs on the coast of the Bahama islands.

Indukata. Dichotomous, with smooth round spreading branches, freely jointed. Ellis and Soland.

Found on the same shores as the preceding species.

Lichenoides. Dichotomous, with the branches a little rugged and not jointed, the tips dilated and flattened. Ellis. Liverwort coralline.

This coralline is of a sea-green colour; it inhabits the Bahama islands.

Rugosa. Dichotomous, with cylindrical branches, hardly jointed, rough, with transverse wrinkles, and compressed at the tips. Ellis and Soland. Fucus Marinus, &c.

Found on the coast of Jamaica.

Marginalta. Dichotomous, with freely jointed smooth flat branches, and raised margin. Ellis.

This kind occurred on the shore of one of the Bahama islands. Mr. Ellis observes, that though this coralline is found, when dry, on the shore, more flat than the rest of this kind, it is very probable, when it is fresh taken out of the sea, it is much rounder, the fibres in the fibre being extremely delicate, which occasion its shrinking very much, when the gelatinous fluid is evaporated.

Cylindrica. Dichotomous, with cylindrical and nearly equal smooth joints. Ellis.

Mr. Ellis received this species of coralline preferred in spirits, from the West Indies, and observed by that means the internal parts appeared full of a clear gelatinous substance. Upon opening some of the joints, a number of minutely branched tubes were also discovered, and hence this writer concludes, that the tubular-hollow appearance described by authors, proceeds from their having diffused only dried specimens.

Obtusata. Dichotomous, with oval-oblong joints, a little compressed and rounded at the ends. Ellis.

Inhabits the shores of the Bahama islands.

 Oblongata. Dichotomous, with oblong cylindrical joints, a little compressed. Ellis

A species allied to the foregoing corallines, and found on the shores of the same islands.

Lapidescens. Dichotomous, with cylindrical downy branches. Ellis.

This kind is sometimes found trichotomous, or three-branched, instead of two. In specimens just received from the sea, the surface appears covered with short hair-like verticillate down, of a reddish colour, disposed in regular circles, one above another.

Barbata. Dichotomous, with short cylindrical joints; those at the extremity bearded at the tips. Linn.

Inhabits the shores of Jamaica, and measures about three inches in length. This is the bearded, or bead-coraline, of Ellis.

Rosarium. Dichotomous, with round bead-like joints, those of the stem longest and cylindrical. Ellis. Rosary coraline.

Nearly allied to the last, but specifically different. A native of the West Indies.

Cuspidata. Branches often dividing into four parts, and ending in sharp points; joints cylindrical, and united by a gluttonous teninous substance. Ellis.

Found in the West Indies; it is very brittle, white, and grows in tufts about three inches high.

Tribulus.
TRIBULUS. Branches often dividing into five; joints two-edged, and united by a glutinous tendinous sub stance. Linn.

A West Indian species, of a whitish colour, and rather larger than the lath.

Flagellum. Stem simple, incurred, with the branches sticking together, in a foliaceous fan-shaped manner, and somewhat waved. Linn.

This coralline is also found in the West Indies, and varies much in figure, being sometimes of a flat kidney shaped form, of about an inch in height, and sometimes expanding to a large subdivided, lobed, and undulated mass, from one to five inches broad, and as many in height. At the bottom of the stalk is a tuft of fine hair-like tubes. There are many kinds of this curious coralline found in the West Indies, which vary in colour from a greenish-brown to a milk white.

Conclutinata. Stem fiddle, slightly incurred, with the branches dichotomous, and agglutinated together, and forming a naked fan-shaped leaf. Linn.

Found on the coast of the Bahama islands; the colour sea-green, and the height an inch and a half.

Phoenix. Stem fiddle, incurred, terminating in an oblong frond, composed of distinct fasciculated branches, produced on all sides, the sub-divisions of which are united together, and appear quite flat. Linn.

This is the palm coralline of Ellis, a singular species found on the coast of the Bahama islands; it is of a milk' white colour, and about three inches and a half high.


This coralline varies in the thickenfs of its branches, as well as in size, being found from one to four inches long. In some the item is very short, in others four times the length of the head. The joints are easily distinguished where the branches divide; the item is composed of tubular filaments covered with calcareous crust; its general colour is white. This sort of coralline adheres to flakes by the base of its filaments, and is often found attached to such bodies, in large clusters, in the West Indian ocean.


This is one of the most singular of the coralline genus, and differs from the rest, among other particulars, in having the item regularly wrinkled. The item is small at the base, and grows wider as it rises, till it sends forth its branches at the top; it adheres at the base like the fuculare, being composed of ramose tubes, which tubes do not leffen as they extend or branch out, but have an equal diameter throughout their whole length. The species is found in clusters in the American seas, particularly near the Bahama islands.

We must lastly mention the corallina teretris of Linnaeus, a species, according to that writer, distinguished by having the branches placed opposite, and the joints cylindrical, with lateral peduncles, and transversely wrinkled fructifications; it is further added, that the species is a few lines high, and inhabits heaths in Friesland. Gmelin admits it as a species of coralline, with some doubt, and seems uncertain whether to consider it of the animal or vegetable kingdom, and undoubtedly not without reason, for it has been described by different writers, both as a plant and a coralline. Meele defines it to be a vegetable of the cryp-
close across, and crampcd together with iron. On each side lengthways of this bridge or flage, there was a parapet, which reached just above a soldier's knee. At the farthest end of this flage or ladder, there was a bar of iron in shape somewhat like a pellc, but sharpened at the bottom, or brought to a point at the lower end. And connected with the top or upper end of it, there was a ring. To the ring there was fixed a rope, by means of which, with the help of the pulley at the top of the pillar, the machine was hoisted up, and as an enemy's vessel approached let fall on it, sometimes on the prow, and sometimes on either side, as an opportunity presented itself. The farthest end of the machine falling with great force, struck into the deck of the enemy's vessel, and held it fast. In this situation, if the two vessels happened to be side by side, the Romans, who first made use of such means in the sea-fight between them, commanded by Diilius, and the Carthaginians, leaped on board the enemy's vessel from every part of the side of their own at once. But if the vessels were joined only by the prows, they then went two and two abreast along the machine, the two foremost extending their shields or bucklers right before them to ward off the brokes or blows that were aimed at them in front, whilst those that followed, refted each of them, the bofis of his buckler upon the top of the parapet on either side, and thus covered both their flanks. Such were the machines employed on that occasion by the Romans, to which they gave the name of Corvi, or Corbeaux.

Some French writers give the name of Corbeaux to the machines with long beams extending beyond the battlements and iron-stands bolpended to them by chains, with which Archimedes, at the siege of Syracaie, under Marcellus, raised the Roman vessels erect out of the water, and then, by lowering the chains from the beams, let them fall into the water sometimes on one side, and sometimes bottom uppono foot. But it is evident from Polybius's account of those machines, that they were quite different from the corvi of the Romans, which we have just given a description of. The corve was also very different from what these writers call the corve a later-coursants, the corve a griffets, the corve demgfiex, the corbeau tenaille, and the corbeau a fafe.

**Corbeil, in Natural History, the name of a curious species of Ochama.** It is of the larger kind, and is deeply frilated, both longitudinally and transversely; so that it has a fort of reticulated surface, like balst-work.

**Corbeil, in Latin Corbelin, in Geography, a town of France, in the department of the Loir, and district of Montargis; eight miles N.W. of Montargis.**

**Corbeil, in Architecture, the representation of a basilic, sometimes seen on the heads of carvairds.** The word is also used for the vate, or tambour, of the Corinthian column; so called from its resemblance to a basilic, or because it was first formed on the model of a basilic.

**Corbeil, or Corbul, is also used, in Buildings, for a short piece of timber placed in a wall, with its end sticking out six or eight inches, as occasion serves, in manner of a shouldering-piece. The under-part of the end, thus sticking out, is sometimes cut into the form of a boulte; sometimes of an ogee, and sometimes of a face, &c. according to the workman's fancy; the upper-side being plain and flat.**

Those corbels are usually placed for strength immediately under the semi-girders of a platform, and sometimes under the ends of chamber-beams: in which latter case they are commonly placed a foot or two below the beam, and have a piece of timber standing upright close to the wall from the corbel to the beam.

**Corbeil, is also used by some architects for a niche, or hollow, left in walls for images, figures, or statues to stand in.**

**Corbeilin, in Geography, a town of France, in the department of the Arve, and district of La Tour-du-Pin; 30 miles N.E. of Lyons.**

**Corbeny, or St. Markou, a small town of France, in the department of the Aisne, with a priory of Benedictines, where the kings of France used to pray for nine days, after having been anointed at Rheims.**

**Corbera, a town of Spain, in the province of Valencia; 20 miles N. of Valencia.**

**Corbett, in Architecture, is used by some, as Harris, in his Lexicon, for corbel.**

**Corbeuntos, in Ancient Geography, a town of Asia, in Gallia, assigned by Ptolemy to the Teutoburger.**

**Corbia, a town of the island of Sardinia, situated 25 miles from Bos, according to the Itinerary of Antonine.**

**Corbiana, or Corbiana, a province of Asia, between Hyrcania and Bactriana, according to Strabo, who lays that it was in the country of the Elymean.**

**Corbie, in Latin Corbela, a small town of France, in the department of the Somme, on the Somme, in N. lat. 5° 32' 32", one hundred miles north of Paris; it is the chief place and canton in the district of Amiens, and has 1941 inhabitants. The whole canton contains 11,626 inhabitants dispersed in 24 communes upon an extent of 175 kilometres and a half.**

**Corbien, in Ancient Geography, (Khorrom al-Ash) a place of Asia, on the banks of the Gyndes, S.S.W. of Ecbatana and N.N.W. of Susa.**

**Corbières, in Geography, a town of Southern France, and chief place of a bailiwick, in the canton of Carcassonne, 10 miles south of Carcassonne.**

**Corbières, a valley of France near the Pyrenees, celebrated on account of a victory which Charles the 22nd obtained over the Saracens.**
CORBIGNY, or ST. LEONARD, in Latin Corbiniacum, a small town of France, in the department of the Nievre, chief place of a canton in the district of Clamecy, has 2315, and the whole canton 11,221 inhabitants. The territorial extent of the latter is 307 kilometres and a half. It is composed of 17 communes.

CORBILLO, in Ancient Geography, (Cuoton) a port of Gaul, upon the Loire. M. D'Avrille places it at a little distance from Conthominum or Nantes to the west.

CORBIO, a town of Spain, belonging to the Suebittani.

CORBIBEAU, from Corbin, a raven, in Ornithology, an African bird, described by M. F. le Vaillant, in his "Histoire Naturelle des Oiseaux d'Afrique, &c." This bird is similar to the raven in the shape of his body, his feet, and his claws; his middle claw is united as far as the first articulation, by a membrane, to the inner one; and the feathers on the lower part of his back are turned upwards, and cover his nostrils; but he is unlike the raven in his back, in the length of his wings, and in his graduated (stage) tail. He appears, says the writer, to occupy in part the interval between the genus of the ravens and that of the vultures; though he resembles the former in a greater degree than the latter. He is similar to the African vulture in the size of his wings, which when spread are three inches longer than his tail; in his graduated tail, in the form of his beak, which is compressed side-ways, convex above, crooked and rounded. These particulars distinguish the corbeiba from all the species of ravens hitherto described; and this bird may be always ascertained by the white patch on the nape of his neck, which strongly contrasts with the glossy black that constitutes the rest of his plumage; except a white mark which separates the files of this white patch on the back of his neck, and encircles the neck. This bird has some resemblance, in point of form, to birds of prey; and his manners and mode of life confirm the resemblance. Corbin constitutes the chief part of his food; and these birds frequently assemble in large and noisy crowds. The appetite for flesh and blood leads him to kill lambs and young antelopes, and to pursue even the largest quadrupeds. He flies with great strength, and raises himself to a great height by his long wings. He constructs his nest, in October, amidst the trees; and lays four eggs greenish, spotted with brown. The corbeiba is not a bird of passage, but continues the whole year in the country where he was born. The female is less than the male, and the black less glossy.

CORBRENE, in Ancient Geography, a people of Afia, placed by Polybius in the valleys of Media, with the Cofianus and other barbarous nations.

CORBRIDGE, in Geography, a place of England in Northumberland formerly a borough, which sent members to parliament. In 1295 it was burned by the Scots, and in 1311 suffered severely from the same invaders; 4 miles east of Hexham.

CORBULO, Gna. Domitius, in Biography, a distinguished commander under some of the Roman emperors. By Tiberius he was made superintendent of the highways in Italy. His conduct in this situation was questioned by succeeding sovereigns. In the year 37, he engaged in military service, and had the command of an army in Lower Germany, among whom he maintained, though at the expense of his humanity, the strictest discipline. In this commission he was eminently successful over the enemies of the empire. By Nero, in 54, he was sent into Armenia, which was invaded by the Parthians. He employed all his efforts in restoring the discipline of the legions which had been encroaved by the luxury of Syria. A maxim by which his conduct was governed, was, "that an enemy might be conquered with a pick-axe," referring to the labours of entrenchment and fortification, for which the Roman armies were so much distinguished. No frequency, either of foment or climate, prevented him from keeping his troops in the field; and in suffering, as well as in exertion, he was an example to his men, going contantly in their clothing, and with his head bare. He never pardoned a defeter who was apprehended. His various successes were important to the government under which he was employed, and will be related under the article Rome. After he had forced the Parthians to an accommodation, he became, on account of the glory attached to his military reputation, an object of suspicion and jealousy with Nero, who resolved upon his death. He accordingly summoned him to his presence by a letter filled with the most flattering expressions of regard. The brave soldier scorned to suspect the integrity and honour of his infamous sovereign. He prepared to attend the court, but no sooner had he reached the port of Corinth, than he met an order to die. Reflecting for a moment upon his own want of prudence and foresight, he exclaimed, "I have merited my fate by trufling to the professions of the monfier," and instantly plunged his sword through his body. This was in the year 67. He left behind him memoirs of the severel wars in which he had been engaged.

CORBUT, Charles and Philip, two draftsmen and mezzotintoopers of London, by whom we have several portraits from different masters, as well as other prints from Vandyke, Ramsey, Titian, Oilade, Renolds, Wilton, &c. Charles Corbut, who was the elder, flourished about the year 1760. Heinecken, Surtt.

CORCANG, or Al. Ioraniyan, in Geography, a town of Afia, on the river Gihon.

CORCAS, or Grand Corcas, an island almost in the form of a crescent, N. of St. Domingo, in the windward passage, about seven leagues W. of Turk's island, and about twenty E. of Little Inagua, or Heneagua, N. lat. 21° 55'. W. long. 70° 55'.

CORCELET, in Natural History, that part of the fly cliffs which is analogous in its situation to the breast in other animals. Many have called it the breast in that also, but improperly; because the breast of other animals is the place of the lungs and trachea; but these organs are in the fly clafs distributed through the whole body. The wings are affixed to this part of the fly clafs; and there are some diffecrations of great consequence, in regard to the arrangement and distribution of those animals into genera. Rezurrer's Hist. Infest. tom. iv. p. 126.

CORCALLE, in Geography, a river of France, which runs into the Arroux near Autun.


Gen. Ch. Cal. Perianth five-leafed; leaves linear-lanceolate, acute, erect deciduous. Cor. Petals five, oblong, oblique, narrowed towards the base, erect, the length of the calyx. Stam. Filaments numerous, capillary, shorter than the corolla; anthers small. Fil. Germ superior, pyramidal, fiddle thick, very short; styles simple or bident. Peric. Capsule from two to five-celled, from two to five-valved. Seeds numerous, angular.

Eff. Ch. Corolla five-petalled. Calyx five-leafed, deciduous. Capsule from two to five-celled, from two to five-valved. Sp. 1. C. vilicosus, Iinn. vilicent-leaved corchorus, or common...
le-shaped." Root annual. Stem about two feet high, cy-
indrical, smooth, even-furnished, a little branched. Leaves alternate, some spear-shaped, some oval, some almost heart-shaped, serrated, with a bristle-like reflexed appendage on each side of the base, on long slender petioles; stipules simple, small, at the base. Flowers small, reddish-yellow; peduncles a line and half long; bracts three, awl-shaped. C. triflorus, somewhat cylindric or spindly-shaped, two inches long, obliquely pentagonal, attenuated into a beak at the tip, five-celled, five-valved; cells divided by incomplete transverse partitions. Seeds numerous, nearly pyramidal, dark brown, fixed in a double longitudinal row to the cen-
tral margin of the pericarps. A native of Asia, Africa, and America; cultivated as a pot-herb in Egypt, Syria, and other parts of the East, particularly by the Jews. It is said to poftice some medicinal qualities, and to be useful as an emulent, a sweetener, and a pectoral. 2. C. tri
queterous, three-celled, three-valved; angles bifid, flabrous; leaves oblong; lowest ferratures bristle-shaped." Root an-
ual. Stem a foot high, cret, cylindrical, even-furnished, green. Leaves alternate, petiolate, undulate-ferrated; fit-
pules bristle-shaped, small. Flowers yellow; peduncles nearly opposite to the leaves, short, two-flowered; calyxes angular, petals narrow. C. triflorus linear, trian-gularly primiti-
flaped, channelled at each angle, flabrous, obtuse and 
fimple at the tip. A native of Arabia. 3. C. trifida. Linn. Mant. 56.; Mart. 3. Lam. 3. (C. Americanus and: 
Linn. 6. Sept. 127. fig. 4.) 5. trilocu-
laris; Burm. ind. 2.32. tab. 37. fig. 2. "Capsules linear, nearly cylindrical, flabrous; lowest ferratures of the leaves bristle-shaped." Stem even-furnished, green. Leaves lanceo-
late, marked with lines, undulate-ferrated. Capsules termi-
nated by the three, much diverging, bifid styles. La Marck 
received from Sonnerat an East Indian Specimen, which, be-
seems to be C. trilocularis of Burman, and to be somewhat 
different from Plunet's plant. Its leaves are linear-lan-
colate, toothed, on short petioles; its capsules grow two 
or three together, on very short peduncles, and are termi-
nated by three diverging points, which do not appear bifid.
1. tab. 85. (C. americana carpini folio, fructu longiore; 
25. fig. 1.) "Capsules oblong, three-celled, three-valved, 
fix-furnished, fix-culpidate; leaves heart-shaped; lowest fer-
ratures bristle-shaped." Root perennial. Stem about a foot 
high, cylindrical, purplish, with divercating branches. 
Leaves petiolate, oval-heart-shaped or oblong, edged with 
sharp teeth, the two lowest sometimes, but not always, ex-
tended into a long awl-shaped appendage. Flowers yellow, 
small, lateral, two together, on short petioles. Capsules termi-
nated by three widely divericating bifid beaks; valves mark-
ed on the inside with obsolete transverse ferratures, instead of 
partitions; furnished with a double, crenulate, and some-
what undulated dorsal wing. A native of the Weft Indics. 
5. C. acutangulus. Lam. 5. Wil1l. 5. (Lyfimachia; Pluk. Phyt. 
tab. 44. fig. 1.) "Capsules prismatic-wedge-shaped, acutely 
angualr, three-toothed; leaves egg-shaped, sometimes with 
a single bifide at the base; petals hispid." Root perennial. 
Stem about a foot high, cylindrical, rather slender, hispid, 
branchcd. Leaves alternate, on long petioles; stipules five 
or fix lines long, narrow, bristle-shaped. Flowers yellow, 
small, lateral, in pairs, on short peduncles; petals oblong, 
rather narrow; bracts three, bristle-shaped, often longer 
than the flowers. C. trifidus long, narrowed towards the base, pentagonal, two of the angles more acute and more 
pronounced than the others, terminated by three biffid beaks.
Mart. 5. Lam. 5. Wil1l. 7. Gert. 
7. Lam. 179. fig. 6. Lam. Ill. Pl. 478. fig. 3. (Alcea fosa. 
corchorus; Pluk. aln. 18. tab. 257. fig. 4. Gemia favis; 
Rumph. amb. 5. 212. tab. 28. fig. 11.) "Capsules round-
ish, depreffed, wrinkled; lowest ferratures of the leaves 
bristle-shaped." Root annual. Stem five or six feet high, 
tete, cylindrical, smooth, branched. Leaves five or fix 
inches long, petiolate, oval-lanceolate, toothed, thin, pale 
green above, glaucous underneath. Flowers small, lateral, 
flgile; calyx-leaves conceave, incurred, shorter than the 
corolla; petals emarginate. C. trifidus short, flatid, wrinkled, 
five-celled, five-valved, (imperfectly ten-celled, ten-valved; 
with larger cells fertile; five smaller barren, placed between 
the others near the circumference of the capsule; Gert.) 
A native of China and the East Indies. A kind of 
broth is obtained from the macerated flms, which is much ued 
Wil1l. 6. Vahl. symb. 3. p. 69. (Euphrasia affinis; Pluk. ambl. 
85. tab. 439. fig. 6.) "Capsules consist, woolly, fidedeleed, 
nerly, flabrous; leaves oblong-elliptical, petiolate, withoout 
bristle-shaped appendages at the base." Lam. Root per-
ennial. Stem one or two feet high, slender, cylindrical, almost 
entirely smooth, a little branched. Leaves less than an 
indefinite, alternate, toothed, petals somewhat villous; 
slipules simple, narrow-lanceolate. Flowers yellowish, small, 
almoft sessile, lateral in fascicles opposite to the leaves. 
Capsules five or fix lines long, cret, three-celled, five-celled, 
furred. A native of the East Indies. 8. C. biflorus. 
Amer. 165. Hort. 3. 57. Plf. 81. tab. 157. (Guazuma; 
Plum. gen. 36. Burm. amer. tab. 104.) "Capsules round-
ish, woolly; leaves egg-shaped, obtuse, tomentous, equally 
furred." Linn. "Leaves elliptical, tomentous, crenate; 
capules ovate-oblong, downy, umbellett." Lam. A shrub 
three feet high, or more; branches alternate, cylindrical, 
clothed with a whitish cottony down. Leaves alternate, 
petiolated, near two inches long, and one broad. 
Flowers yellow; common peduncles opposite to the leaves, the length of the petals, foliaries, cottony, supporting five or fix pe-
decilled flowers; calyx cottony on the outside; petals scarcely the length of the calyx. C. trifida a little immersed, 
very woolly, obtuse, two-celled. A native of South Amer-
oblong, woolly; leaves tomentous." Thunb. Stem 
flabby, cylindrical, cret, two feet high, and more; 
smooth, purple, branched; branches alternate; at the bot-
top purple and smooth; at the top tomentous, cret, 
and like; branchlets filiform, spreading, tomentous. 
Leaves alternate, petiolated, armed, spreading; petiole very 
short, tomentous. Flowers orange-coloured, axillary and ter-
inal, generally solitary. C. trifida cylindrical, woolly. 
A native of Japan. La Marck afferts that it is different 
8. Lam. 9. Wil1l. 13. Jacq. Hort. 3. tab. 78. (C. folio 
ulmi major; Plum. Sp. 7. Burm. Amer. tab. 103. fig. 2.) 
"Capsules oblong, hairy; item hairy; leaves oblong, equally 
furred." Root annual. Stem about two feet high, cy-
indrical, rather slender, branched. Leaves alternate, un-
equal at the base, on short hispid petioles; stipules narrow, 
very
very hirsut. Flowers yellow; peduncles and calyces hirsutip; petals oblong, shorter than the calyx, obtuse, narrowed a little towards the base; stigmas yellow, the length of the petals; stem oblong, columnar, hirsut, with whitish hairs directed upwards; style biflorn, the length of the stigmas; filaments two, not spirading. Capsule near an inch long, two-furrowed, two-valved. Seeds small, black. A native of the West Indies, and South America. 11. C. japonicus. Linn. Sp. Pl. 1. Mart. 9. Lam. 18. Willd. 14. Jacq. Hort. 3. tab. 59. (C. folio linnii minor; Plum. Sp. 7. Birm. Amer. tab. 103. fig. 1. Corehora affinis; Siam. Jan. 50. huit. 1. 145. tab. 94. fig. 1. Corea folcis minoribus; Brown. Lam. 1. 147.) "Capsules linear, compressed, two-valved; leaves lanceolate, equally ferrated." Root perennial. Stem about two feet high, almost woody, erect, slender, cylindrical, panicked, somewhat pubescent. Leaves smaller than those of the preceding species, without awl-shaped appendages at the base, on rather long petioles, which are pubescent on one side. Flowers yellow, lateral, peduncled, solitary, or in pairs; germs cloathed with short hairs. Capsules nearly smooth, two-valved. According to Linnaeus, the spring flowers are without petals, tetradromous, with a four-leaved calyx; but those produced in autumn, correspond with the generic character. 7. C. japonicus, a native of the West Indies. 12. C. japonica. Mart. 7. Lam. 11. Willd. 14. (Aped. Fl. Jap. 227. (Toito, vulgo jambo baki; Kämpf. amen. 844.) "Capsules round, smooth; leaves doubly ferrated." Stem shrubby, two feet high or more, smooth; branches alternate, filiform, angular. Leaves several together from alternate buds, petioled, almost heart-shaped, ovate-acuminate; stigmas acute, almost pinnate, nerving, villous, and particularly so on the nerves underneath. Flowers yellow or orange-coloured, terminal, solitary, on short peduncles. A native of Japan, where it is cultivated on account of its beauty. There is a variety with double flowers. 13. C. tetragonum. Mil. Mart. 15. (C. flore flavo corynthus phyllido; Pluk.) "Capsules quadrangular, reflexed at the points; leaves ovate-heart-shaped, crenate." Stem about two feet high, with small branches. Flowers pale yellow, very small. Capsules swelling, rough, about an inch long, flattened at the top. A native of both Indies. 14. C. linealis. Mil. Mart. 11. "Capsules linear, compressed, two-valved; leaves lanceolate, ferrate toothed." Stem three feet high, with weak branches. Leaves about three inches long, and one broad, fitting close to the branches. Flowers pale yellow, very small, opposite to the leaves, solitary. Capsules two inches long, flat, two-celled. A native of New Spain, about Cartagena. 15. C. bifurcatus. Mil. Mart. 12. "Capsules linear, compressed, with two horns at the points; leaves heart-shaped, ferrated." Stem between three and four feet high, herbaceous, strong, with upright branches. Leaves on long slender petioles, and between them many smaller leaves, nearly of the same form, and fitting close to the branches. Flowers pale yellow, very small, lateral, on short peduncles. Capsules near three inches long, flat, ending in two horns, two-celled. A native of Jamaica; raised from seeds sent to Miller by Dr. Houlton. 16. C. flexuosus. Mart. 14. Willd. 12. Thumb. in Linnaeus. Trans. 2. 355. "Leaves doubly ferrated, cupuldate; stem zig-zag." Stem cylindrical, rendered somewhat angular by the deciduous leaves, two feet high, erect, smooth. Leaves two inches long, alternate, petioled, obliquely heart-shaped, villous, spreading. Flowers yellow, terminal. 17. C. ferratus. Mart. 15. Willd. 9. Thumb. ibid. "Leaves oblong, ferrated, cupuldate; branches smooth." Stem erect, smooth, branched; branches cylindrical, purple, erect. Leaves two inches long, alternate, petioled, spreading; stigmas large, bristle-shaped at the tip, slightly rough with hairs above, smooth underneath. 18. C. floridus. Mart. 16. Willd. 8. Thumb. ibid. "Leaves egg-shaped, bristle-ferrated, opposite; stem and branches zig-zag, climbing." Stem cylindrical, branched; branches opposite, divaricated. Leaves opposite, on short petioles, rounded at the base, acuminate, an inch long. Flowers yellow, terminal, solitary, foliar. The last three species are natives of Japan.

Propagation and Culture.—All the species may be raised from seeds sown in the spring in a hot-bed, protected by a glass frame. Soon after they come up, they should be transplanted into a fresh hot-bed; when they are grown strong, they should be removed into separate pots; and if gradually exposed to the open air, they may be shewn out of the pots in June, and set in an open border, where they will generally flower and ripen their seeds. C. hirsutus must be kept in a bark-bed in the hothouse during winter. Miller.

CORCIA, in Geography, a town of the island of Corfica; 14 miles N.N.W. of Corte.

CORCIEUX, a small town of France, in the department of the Vosges, chief place of a canton, in the district of St. Vincent, with a population of 1143 individuals; that of the canton amounts to 8351, upon 17724 hectares; and the number of its commune is 13.

CORCOBA, in Ancient Geography, a town situated on the south coast of the island of Tarrabona, according to Ptolemy.

CORCOMA, a town of Africa, in Mauritania Caesariensis, between Carepuna and Lagruntum. Ptolemy.

CORCONIANA MANSIO, a place of Sicily, on the route from Catana to Agrigentum, according to the Itinerary of Antonine.

CORCOPAS, a river of Pannonia, which, according to Strabo, passed before Naupontus, and discharged itself into the Savus.

CORCULUM, in Vegetable Physiology, is a term used by Linnaeus, after Cæsarianus, for the heart, or more properly embryo, of a seed; alluding to its shape, which, in the walnut, and many other seeds, resembles the animal heart in miniature. It is the most important and even essential part of a perfect seed, to which all the rest are subservient, being the point whence the future plant originates. In unpregnated seeds it is deficient, or rather abortive; in fertile ones it is closely connected with the cotyledons, on which it depends for the food supplies of nutriment, and other exciting causes of its evolution. The corculum consists of two parts: the radícula, or radicle, which, by an unerring law of nature, descends in order to become the root; and the plumula, or feather, which, as regularly accedes, and becomes the stem and leaves. Dr. Darwin ingeniously accounts for this diversity of direction in these two parts, from the former being mutable by moisture, the latter by air; and presumes that inarch extends itself accordingly where its vitality is most excited. Other philosophers have explained the same phenomenon, far less happily, on mechanical principles. See COTYLEON and EMBRYO. S.

CORCULUS, the little heart, in Natural History, a name given by authors to a small species of cordiformis, or heartbell, of a rose colour.

CORCURA, in Ancient Geography, a town of Asia, in Alyssia. Ptolemy.

CORCYPRA, (Corcyra) one of the Greek islands, situated in the Ionian sea, and called, in more ancient times, Drapane, Scheria, and Phoxaia. It is said to have taken its name from that of a nymph, whom Neptune ravihing in this
this island. It is about 45 miles in length, 21 in breadth, and 510 in compass. It was famous for the delightful gardens of King Alcimus, who courteously entertained Ulysses after his shipwreck. The southern parts of the island are barren, mountainous, and ill provided with water; but the northern coast is very fertile in all kinds of delicious fruit, excellent wines, olives, grain, &c.; whereas Homer has denounced it the fruitful Scheria. It had anciently two cities of no small note, viz. Coregyra and Saliopus: the former was the metropolis of the island, and once very powerful, as appears from Thucydides, and others; the latter is commenced by Pliny and Ptolemy as a wealthy and well-built city, but Ciceron calls it only a haven.

This island is said to have been first inhabited by the Phoenicians, whence it was called Phoenacia; but afterwards the Corinthians sent thither a numerous colony, B. C. 756. The Corecyrians were, for some time, masters of the isle. Their government was first monarchical; but afterwards they formed themselves into a republic, and made a very considerable figure in the flourishing times of Greece. Herodotus informs us (lib. vii. cap. 168.) that they were very powerful by land; but he much blames them for their deceitful conduct, with respect to the aliment they promised the Greeks against Xerxes: for, being invited by the Athenian and Lacedaemonian ambassadors to join them in the common cause, they readily engaged to send powerful succours, alleging that they would not neglect the safety of Greece in so imminent a danger; being well apprized, that if the enemy prevailed, they would soon be reduced to the condition of slaves. The ambassadors departed; and the Corecyrians, fitting out a squadron of 60 ships, sailed to the coast of Peloponnesus, and having anchored about Pylos and Tenarum, waited in that station to see the event of the war, being resolved to join the victorious party. When they heard that the Persians were defeated at Salamis, they left their station, and joined the rest of the Greeks, pretending that they had been prevented by the Eteocline winds from doubling the cape of Melos, and being present at the battle. The Corecyrians submitted to Alexander, and remained subject to the kings of Macedon, till they were delivered by the Romans, in the reign of Perseus; from which time they enjoyed their liberty, till the reign of Vespasian, when they underwent the common fate of the other Greek islands and states both in Europe and Asia. The Corecyrian felicitous were proverbial even among the Greeks. See COREY.

Corecyra Mebna, or Nigra, so called to distinguish it from the former, an island in the Adriatic sea, on the coast of Illyricum. The Cutilians built a town on this island. In the war of Illyricum, B. C. 229, the Romans, under the command of L. Postumius Albinus, and Cn. Fulvius Centimalus, landed in the island, and the Corecyrians delivered up the garrison of the Illyrians, who had taken possession of it under the command of Demetrius of Pharos; and the whole island submitted, conceiving that this was the only method of securing themselves for ever from the infatuation of the Illyrians. Upon the conclusion of peace, it was agreed, that Corecyra, as well as some other places, should continue in the possession of the Romans. This island is now called Corfoli.


Corezycz, in Geography, a town of Poland, in the palace of Volhynia; 40 miles N. of Conkiantown.

Corezy, or Kortkamin, a town of Poland, in the palatinate of Sandomierz, on the Vistula; 48 miles W. S. W. of Sando marz.

Cord, or Chord, an assemblage of several threads of hemp, cable or twisted together by means of a wheel.

The word comes from Ceypo, which properly signifies an interline, or gut. wherof cords may be made.

Cord of St. Francis, a kind of rope adorned with knots, worn by the brothers of the fraternity instituted in honour of the saint.

Some, as the Cordeliers, Capuchins, Minorites, and Recollects, wear it white; others, as the Pique, black. Its design is to commemorate the bonds wherewith Jesus Christ was bound.

Cord, the society of, includes a great number of people belonging to religious. To obtain indulgences, they are only obliged to lay five Pater, five Ave Maries and Gloria Patri, and to wear this rope, which must have been first blest by the superior of the order.

Cord of wood, a certain quantity of wood for burning; so called, because formerly measured with a cord.

It is now measured, particularly in Worcestershire, where the name has been regulated by statute, between two lakers of wood, four feet high, and eight feet apart; and is to be four feet broad and high, and eight feet long = 128 cubic feet = 4.74 cubic yards = 5.622 shells or cubic inches of France = 455.223 cubic links.

Cord wood is properly new wood; and such as, when brought by water, comes aboard a vessel; in opposition to that which is floated. All burning wood, not exceeding eighteen inches circumference, is deemed cord wood.


Cord, Magical, an instrument in great use among the Laplanders, and supposed to be of great virtues among them. It is a cord or rope, with three knots tied in it. They use many magical rites and ceremonies in the preparing and tying of this cord; and when thus prepared, it is supposed to have power over the winds; and they will fall, by means of it, a good wind, or at least a promise of one, to a ship. If they unite only one of these knots, a moderate gale is to succeed; if two, it is to be much stronger; and if three, there is to be a storm.

Cord, Unbleached. See Unbleached funiculus.

Cord-wood, in Rural Economy, a term applied to the small sorts of broken-up or other wood, which was formerly sold by the cord.

Corda, in Ancient Geography, a town of Albion, in the country of the Sigeone. As this place was situated farther to the N. W. than the other towns of the Sigeone, it is thought to have stood on the banks of Loch-Cure, out of which the river Neith springs.

Cordage, is used, in general, for all sorts of ropes and cords, great and small; and more particularly for those that are used in the rigging and fitting out of small vessels. The word is also used for the art of preparing andmanufacturing the ropes, &c. See Cable. See also Rope, and Rigging.

The naval cordage of different ages and nations has been formed of very different materials. Thee of the earlier ages were probably thongs of hide or leather; the use of which was retained by the Caledonians in the third century, and by the nations north of the Baltic in the ninth and tenth centuries. They are even now used as ropes in the windy isles of Scotland. They were superseded in the southern parts of Britain, and on the continent, at an early period, by iron chains. Accordingly we find, that in the maritime and commercial
commercial country of the Veneti, who were intimately connected with the Belgts of Britain. Iron chains were used for cables in the days of Caesar. However, in the more improved countries of the south, thongs of leather and chains of iron had long given place to the use of vegetable threads; and the art of combining them into strong cords was under-footed and practiced. In this manner the Greeks used the common rushes of their country, and the Carthaginians applied to the same purpose the spartium or broom of Spain. And as all the cordage of the Romans was formed of these materials, at their last defeat on our island, the art of manufacturing them would necessarily be introduced with the Roman settlements among the Britons. Under the direction of the Roman artists, their junct, or rushes, would be wrought into cordage. Accordingly the remains of old cables and ropes are still distinguished among the British sailors, by the name of "old junk." Moreover, the Roman fails, which, in the days of Agricola, were composed of flax, were afterwards made of hemp; and our own are therefore denominated "canabilis," or "canvas," by our present mariners.

About the same period, the same materials were substituted for the junk of the British cordage; for the use of hemp ropes upon land, and of hempen nets for hunting, was very common among the Romans in the first century. The Indians still make their cordage of the bark of cocoas, and other trees, and of strands of plants. The cordage of the British navy is made of the Riga or best Petersburg break hemp, and tarred with good Stockholm or Ruffia tar.

The cordage is said to be baked, when, having passed a fove, or other hot place, it is drained of all its moisture. White cordage is that not yet pitched. Cordage pitched in the fove, is that which is passed through hot pitch as it comes out of the fove. Each quintal of cordage may take up about twenty pounds of pitch. The cordage is sometimes pitched in the thread. For the method of making ropes and different sorts of cordage, see Rope-making.

By 25 Geo. III. c. 56, no person shall use, in the manufacture of any ropes for shipping, (or sell the fame,) hemp called sheet-chucking, half clean, whole line, or other topping, cordils, damaged hemp, or any hemp from which the flable part thereof shall have been taken away by the manufacturer, on pain of forfeiting, for the manufacturer, such rope, and treble the value of it; and for the vender, not being the manufacturer, a sum equal to treble its value. For the better distinguishing the quality of such ropes, that which is inferior to clean Petersburg hemp shall be deemed inferior cordage, and marked accordingly, by running from one end of it to the other three-tarred mark yarn, spun with turn contrary to that of rope yarn, and also one like tarred yarn in every other rope for the use of shipping; and the maker shall mark or write, on a tally to be affixed on it, the word "flable," or "inferior," (as the case shall be,) and also his name, signed by himself or his attorney, together with the name of the place where manufactured; and in default thereof, shall forfeit 15s. for every hundred-weight. And if any such rope-maker shall wilfully or knowingly permit his name to be put to any such ropes, not being of his own manufacture; or if the vender or proprietor, or any other person, mark upon the tally the name of any perfon, not being the manufacturer, he shall forfeit 20l. And if any person shall make any cables of any old or worn thuff, which shall contain above 7 inches in compass, he shall forfeit four times its value. Foreign-made cordage, for which no duties have been paid, belonging to a ship owned by any of his majesty's subjects, resident in Great Britain, or the British colonies, and entering any port in this kingdom, shall be duly entered on oath at the custom-house (standing and running rigging excepted); and before the ship be cleared inward, the master shall pay the duties, on pain of forfeiting the cordage, and 2s. for every cord of it. Upon the importation of cordage, tarred or untarred, there is a duty payable of 6s. 6d. per cord, and no drawback allowed upon exportation; and in the port of London, there is a further seaveage-rate of 14d. per cord, or 112 lbs. upon the importation of cables-ropes for cordage.

As to the strength of ropes, or cordage, M. Reaumur takes occasion, in the Memoirs of the Royal Academy, to consider the question, whether a rope composed of several twills, or strands, interwoven, e. g. ten, have more strength to fulfill a weight, than the ten twills would have separately, placed parallel over one another; or, which is the same thing, whether, if each twill be capable of fulfilling the weight of a pound, the whole cord be able to fulfill more than ten?

On the one hand, 1. By virtue of the twilling, the diameter of the rope is made larger than are those of the ten twills together; but it is apparently by its thickness that a rope fulfills a weight, or refills a fracture. 2. Twilled strands have not all, as when parallel; a vertical direction with regard to the weight; several of them, and even the greatest part, have oblique directions, and of consequence do not bear all the share of the burden they would otherwise bear. In effect, they are inclined planes that are only pressed with a part of the load.

Hence it would follow, that the surplus of the strength of the twills might be employed in raising a larger weight.

On the other hand, it is true, that, in twilling the strands, some are stretched, and others left more loose; and the new tension given the former, serves to weaken them, and has of itself the effect of a weight: thus they become less able to fulfill one so large. Tho le more lax, on the contrary, evade, in some measure, the action of weight; for the action is distributed equally on the ten supposed equal twills; and if some, by reason of their particular disposition, receive less than their quota, the weight will act more forcibly on the rest, and will break them, as being more tense; after which, it will easily dispatch the rest, as not being in sufficient number to oppose it.

This is the sum of what can be urged for and against the twilling; to decide between them, M. Reaumur had recourse to experiment. The result was, that, contrary to all expectation, he still found the twilling diminished the strength of the rope; whence it is easily inferred, that it diminishes it the more, as the rope is the thicker. For inasmuch as the twilling diminishes; the more twilling, the more diminution.

The refusal or friction of cordage is very considerable; and by all means to be considered in calculating the power of machines. M. Amontons observes, in the Memoirs of the Royal Academy, that a rope is so much the more difficult to bend, 1. As it is thinner, and more stretched by the weight it draws. 2. As it is thicker; and, 3. As it is to be more bent; i.e. as it is to be coiled, for instance, into a smaller ring.

The same author has thought of ways to prove, in what proportion these different refusals increase: that arising from the smallness of rigidity occasioned by the weight which draws the rope, increases in proportion to the weight; and that arising from its thickness, in proportion to the diameter. Lastly, That arising from the smallness of the gyres, or pulleys,
pulleys, about which it is to be wound, is indeed greater for smaller circumferences than large ones, but does not increase so much as in the proportion of those circumferences.

On this footing, the loss a machine suffers by the cordage, being estimated in pounds, becomes, as it were, a new weight, to be added to that which the machine is to raise. This augmentation of weight will render the cords still the more flint; which excess is to be computed as before.

Thus shall we have several sums still decreasing; which are to be added together, as in the article of friction; and it will be surprising to see what a sum they will amount to.

See Friction.

Where ropes are used in a machine, all the resistence resulting from their diffidence is to be put together; and all that occasioned by the friction; which will make so considerable an augmentation to the difficulty of the motion, that a power which to raise a weight of 3000 pounds, by means of a fixed and moveable pulley, needed only 1500 pounds, must, according to M. Amontons, have 3942 pounds, on account of the frictions, and the resistence of the cordage.

CORDAGE, twice-laid, is that which is made of caft rigging, as shrouds, stays, mooring and other cables, which, if not much worn, will make good ropes for wetting the sides of ships, worming and wooling for cables, spun-yarn for feizing, worming for large stays, feizing for lops of blocks, small cable-laid ropes for warping ships, rat-lines, scaffolding-rope for dock-yards, &c.

When the yarn of this old stuff is overhauled, a little thin tar should be poured on it, which will make it pliable and lie better. The yarn unfit for knotting will pick into oakum for caulking.

CORDA T D E L A F, in Botany. See Leaf.

CORDAX, in Antiquity, a gay sort of dance.

CORDE, MAURICE DE LA, in Biography, born at Reims, where he attained considerable eminence for his classical and critical learning, was made doctor of the faculty of medicine, at Paris, in the year 1559. In the course of an harangue, before his brethren of the faculty, having censured with apathy the manners of the Romish clergy, and some of their ceremonies, and spoken too favourably of the reformed religion, he was seized and thrown into prison. This happened in the year 1560. An edict of pacification being obtained the following year, he was released, and, with the rest of the Huguenots, allowed openly to profess his religion. He was also permitted to practice medicine; but the College, who were firm in the Catholic religion, took him from the place of reader or lecturer. De la Corde was one of the few Huguenots who escaped the massacre, which took place on the eve of St. Bartholomew, in the year 1572; and in 1574, he obtained an order from parliament, reinstating him in his rights in the faculty of medicine. He published, in 1574, "Hippocratis Libellus de his quae Virginibus accident," with Commentaries, 8vo. Paris; and in 1584, "Hippocratis de morbis Multicrura, Interpretatio," folio. Haller Bib. Med. Eloy Diit. Hist.

CORDAU, a feu, Fr. cord-match, or match of cord, fit for retaining a small quantity of fire for a long time, and of furnishing it, or being lighted up, when wanted.

CORDEAU, Fr. a cord made ufe of for measuring ground. That which engineers commonly made ufe of was divided into toises, feet, and inches, in order to have the exact openings or magnitudes of angles, and the lengths of lines, which they wished to trace or measure. But as cords shrink in moist or wet weather, and lengthen in dry, this in-
COR

toon; it has been more worthy appreciated; as well on account of the purity of its style, as from the depth of its researches. M. Cordemoy was elected a member of the French academy in 1755. Besides his History of France, we have a 4 vol. volume of his works, published in 1732. In the latter part of his life, he was afflicted in his literary labours by his son Lewis, who was born in 1651, and who became successively a licentiate of Sorbonne, and an abbot in the church of Clermont. He was a voluminous writer, chiefly on theological subjects; and was considered among the Catholics as an able advocate of their cause, against the attacks of the defenders of Protestantism. He was, however, of considerable service to his father, in the last part of his General History of France, and it is believed, wrote the whole of that part which extends from about the conclusion of the reign of Lewis V. to the end of the work. By order of Lewis XIV. he continued that history from the time of Hugh Capet until the year 1660, which he did not live to finish. He died at the age of 71, in the year 1722. Moreci.

CORDERIE, Fr. a rope-yard. A fort of work-houses or place convenient for making, both for the artillery and vessels, cords, cables, hawser, &c. In inland towns, the corderies are open and uncovered, and common on the rampart, along the walls; and in maritime towns, or for ports, where considerable armaments are made, they are usually low buildings, covered, long, and narrow, constructed near the arsenals and magazines. These last mentioned cordories have generally, in France, been called CORDERIES Royales, because the most of them were built and kept up at the expense of the king. CORDES, in Antiquity Geography, a river of Asia, in Mesopotamia, which, rising in the mountains, pursu'd its course to the south, and encompassing the town of Dara, was lost in a gulf near it.

Cordes, Balthasar, in Biography, born at Antwerp, in the year 1592, belonged to the society of Jesuits in the Low Countries, and was doctor of theology at Vienna, where he attained a considerable share of celebrity, as professor of that faculty. He was a man of great learning, particularly in Greek literature. His principal works, as editor and author, were, "S. Dionysii Areopagitae Opera omnia, Gr. et Lat., cum Scholia, &c." in 2 to. fol.; "Expositionis Patrum Graecorum in Psalmos," in 3 to. fol. He died at Rome, in the year 1650.

Cordes, John de, was born at Lymieux, in the year 1570, and at an early age discovered a considerable turn for literary pursuits, in which he would probably have been encouraged, but the death of his father obliged him to apply to trade. When he was about 50 years of age, a change of circumstances enabled him to relinquish business, and to indulge his original propensity. He entered himselt Into the society of Jesuits at Avignon; but a series of ill health obliged him to quit their seminary, and to pursue his studies privately. He afterwards became a canon of his native place, and a collector of rare and valuable books. He was himself an author and editor of considerable reputation; and after his death, which happened in 1642, his library was purchased by cardinal Mazarine. He was editor of the works of Hincmar, archbishop of Rheims; and of the works of George Cossander. He translated father Paul’s "History of the Differences between Pope Paul V. and the Republic of Venice," and likewise Camilo Portio’s "History of the Troubles in the Kingdom of Naples, under Ferdinando I." Moreci.

Cordes, in Geography, a small town of France, in the department of the Tarn, on the river Ceron; 12 miles N.W. of Alby. It is the chief place of a canton, in the district of Alby, and contains 2,552 inhabitants. The canton contains 24 communes, upon 185 square kilometres, with 8,019 inhabitants.

Cordes de Touffou, a town of France, in the department of the Upper Garonne; 20 miles N.W. of Thoule.

Cordesefagen, a town of Germany, in the circle of Upper Saxony, and district of Pomerania; 10 miles W. of Collins.

Cordes, in Geography, a small town of France, in the department of the Saone and Loire, and district of Autun; 2 leagues N. of Autun.

Cordonato, a town of Italy, belonging to the state of Venice, in the county of Pordenone; 5 miles N. of Concordia.

Cordon, a river of Italy, which runs into the Po, between Belluno and Feltri.

Cordia, in Botany, (named by Pluiter in honour of Eurius Cordus and his son Valeriaus, two German botanists of the sixteenth century, the former author of Botanologica, feu Collectum de varis Herbis; the latter of Annales on Dioscorides, and of a History of Plants in four books with figures.) Linn. Gen. 2, 16. Schrbr. 357. Fid. 36. Ann. Ill. 270. Fift. 2. 382. (Spelletina; Gart. 474.) Chois and order, pantalia mons. Nat. Ord. Acrie. Fifi. Linn. Borognies. Juf. Sebeto, Vent. Gen. Ch. Col. Perisanth one-leaved, tubular, or bell-shaped, toothed or deeply divided. Cor, monopetals, generally funnel-shaped, sometimes campanulate or wheel-shaped, tube, about the length of the calyx, often enlarging upwards; border cleft spreading; generally cut into five, sometimes four, five, seven, or eight obtuse divisions. Stam. generally five, sometimes four, five, seven, or eight, awl-shaped, inserted into the tube; anthers oblong, Tyl. Germ. inferior, roundish, acuminate; style twice bifid; stigma obtuse. Pet. Drape globular or egg-shaped, growing to the calyx; nut narrowed or pitted, two or four-celled; some of the cells frequently abortive. Seeds solitary, egg-shaped, acuminate at the summit.

confiding of lateral branches with a few short ramifications: calyx green, cylindrical, five-crested; divisions of the corolla five or six, open, a little reflexed. *Drupa* black, oval, acuminate, smooth, pulpy; not deeply furrowed, perforated; naturally four-crested, but two of the cells generally abortive or quite obliterated. a. a native of Egypt; b. of the East Indies. Poiret asserts that it is not easy to determine what was the myxa of Linnaeus, and thinks it probable that two species have been confounded, but though the African and the East Indian plants differ a little in habit, and in the form of their leaves, he has, for the present, considered them only as varieties. A more accurate knowledge of their flowers and fruit will be necessary before they can be pronounced to be absolutely distinct. The fruit has been esteemed a valuable medicine in disorders of the chest and urinary passages, but is now entirely out of use in England. The East Indians eat it macerated in salted vinegar, and reckon it serviceable in diarrhoea. An excellent glue is made of the pulp, which is more viscid than that of the *Jujube*. 2. C. indica. Lam. Iii. 1817. Poir. 15. "Leaves egg-shaped, obtuse, crenate near the summit; coriaceous and terminal; calyxes ten-crested." A shrub twelve or fifteen feet high; branches zig-zag, smooth, crenate, pubescent on their upper part. Leaves alternate, petioled, feathery on both sides, marked on the upper surface with small whitish joints, a little pubescent underneath when young; petioles pubescent, half the length of the leaves. Flowers yellowish; peduncles very short; calyces whitish, strongly ridged, four-toothed, a little scarious at the edges; tube of the corolla the length of the calyx; border open, with five, seven, or eight divisions; filaments eight; filaments erect, filiform, villous at the base; anthers oval, compressed; style the length of the filaments. *Drupa* whitish, egg-shaped; not terminated by a recurved point, four-crested, two of the cells frequently abortive. Found by Dombey at Huanza and in the neighbourhood of Lima, where it is very common. La Mareck enquires whether it may not be the *myxa* of Linnaeus, excluding all the synonyms; but there can be no ground for the conjecture, as *Linnaeus* certainly referred to a plant of the old continent. 3. C. philippina. Willd. 2. Phyt. 1. 4. tab. 4. fig. 1. (C. myxa. Poir.) "Leaves roundish, heart-shaped, nervet, veined, oblique. Nearly allied to *C. myxa*, but the leaves are quite entire and the calyxes not ridged. A native of the East Indies. 4. C. monoeica. Willd. 3. Roxb. Coromand. 1. 43. tab. 59. "Leaves roundish, egg-shaped, toothed, veined, pubescent; coriaceous axillary, monoeious." Leaves three inches long or more, two inches broad, alternate, very crenate, acute; petals about one-third of the length of the leaves. Flowers white, small, in axillary or terminal coriaceous, which are shorter than the leaves; corolla funnel-shaped, with five egg-shaped obtuse divisions; filaments within the tube of the corolla; filaments awl-shaped, enlarged at the base, anthers lanceolate. *Drupa* yellowish, globular, point-d, filled with a glutinous pulp. A native of forests on the coast of Coromandel. 5. C. sericifera. Juss. Poir. 3. "Leaves heart-shaped, acutely serrated; lanceolate terminal. Branches erect, cylindrical, smooth and even. Leaves about three inches long and two inches broad, alternate, petioled, egg-shaped, acute or somewhat acuminate, irregularly serrated, membranous, dark green above, yellowish-green underneath; nerves simple, alternate. Flowers in a close, few-flowered, axillary, paniculate, a little leafy at the base of its first branches, small, white; calyx and border of the corolla five-lobed; filaments five. A native of the East Indies; described from a dried specimen without fruit in the herbarium of Jullien. 6. C. rubrocordata. Lam. Iii. 1817. Poir. 4. (Novella nigra, feu amari; Rampf. Amb. 2. 226. tab. Vol. IX. 777.) "Leaves somewhat heart-shaped, entire, even on its upper surface; calyx cylindrical. A tree. *Drupa* spreading, tufted, smooth. Leaves from four to six inches long, or nearly as many broad, alternate, slightly pubescent underneath along the principal nerves. Flowers in short, bove terminal racemes, large, white with a reddish rind; calyx tubular, smooth, three-toothed; corolla funnel-shaped, wrinkled or plaited; tube at least twice the length of the calyx, much elongated near the top; border with six or seven rounded lobes; filaments fix or seven; anthers variable; style shorter than the filaments. *Drupa* the size of a hazel-nut, four-crested; some of them abortive. Discovered by Commodor in the Peralin Islands in the East Indies. 7. C. colletiaco. Lam. Sp. pl. 5. Mart. 6. Poir. 5. Willd. 14. (C. chretioides; Lam. Iii. 1817. Poir. 4. tab. 4. fig. 2. C. chretioda; Lam. Iii. 1817. Poir. 4. fig. 1.) "Leaves oblong-ovate (cordate-ovate; syyt. nat.) quite entire; flowers in coriaceous axillary; calyxes tomentose on the inner side." A middle-sized tree. *Trunk* divided near the top into spreading branches. Leaves alternate, petioled, acutet, wrinkled. *Flowers* yellowish-green, in loose somewhat-paciowed terminal coriaceous; peduncles branched, very unequal; corolla funnel-shaped, with five deep divisions. *Drupa* bright red, the size of a small cherry, with a sweetish clammy pulp. A native of the West Indies, where the fruit is a favourite food of turtles and other poultry. In Jamaica it is called clammy cherry, or turtle-berry tree. S. C. hispida. Willd. 15. (C. colletiaco; Aub. Guian. 1. 219. tab. 86. C. nodolba; Lam. Iii. 1817. Poir. 8.) "Leaves oblollow, alternately both ways, pubescent; flowers in terminal and axillary coriaceous; peduncles hispida. *Leaves* narrower than those of the preceding species. Stem and peduncles hispida. *Corymyx* denfe, somewhat umbellated, not dichotomous-divaricata. *Fruit* white, oblique, acuminate. A native of Cayenne and Guiana. 9. C. tetrandra. Lam. Iii. 1817. Poir. 11. Willd. 16. Aubl. Guian. 1. 222. tab. 87. "Leaves egg-shaped, somewhat heart-shaped, acute, feathery quinque-lobed; flowers in coriaceous terminal; flowers tetrandrous." A tree forty or fifty feet high, with spreading branches. Leaves eight or ten inches long, three or four broad, alternate, entire or slightly undulated, nervet; petals as inch long. *Flowers* greenish; common peduncle forked, dichotomous at the summit, and branched; calyx top-shaped, with four roundish acute lobes; corolla funnel-shaped; tube short, border expanding, four-lobed; filaments four. *Drupa* whitish, round; nuts three or four-crested; somewhat oval, wrinkled, enclosed in a white glutinous subflavus. A native of Cayenne and Guiana. 10. C. tetraphylla. Lam. Iii. 1817. Poir. 6. Willd. 18. Aubl. 1. 432. tab. 88. "Leaves four in a whorl, invariably egg-shaped, quite entire; peduncles lateral, many-flowered." A shrub fix or seven feet high, with knotty branches. Leaves nearly oblong, firm, nervet, a little reticulated, smooth on both sides. Flowers white, sliflie, on long common peduncles; calyx with five acute teeth; corolla funnel-shaped; tube narrow, at the base: border five-lobed; filaments longer than the corolla. *Drupa* yellowish, the form and size of an olive; not very hard, generally one-crested. A native of Guiana, on sandy soil near the sea. 11. Pseudo-ulmis. Lam. Sp. pl. 2. Mart. 4. Lam. Iii. 1817. tab. 96. fig. 2. Poir. 7. (fig. 3.) Amer. 43. tab. 175. fig. 16. Brown Jam 177. tab. 29. fig. 1. "Leaves lanceolate-egg-shaped, quite entire; lanceolate terminal; calyxes tomentose, ten-crested." A considerable tree. *Branches* spreading, cylindrical, clothed on the upper part with a thick covered crenate down. Leaves alternate, smooth, coriaceous, on short peduncle. Flowers large, white,
white, permanent, shrivelling: principal branches of the panicle furnished at the base with narrow sessile bractlets; pedicels short, unequal, three-flowered; calyx oblong, funnel-shaped, slightly toothed; corolla twice the size of the calyx, with four, five, or six almost oval oblong divisions; filaments fleshy to the tube of the corolla, from the base to the middle; anthers incumbent, yellow; germ oblong, filiform; style shorter than the filaments; stigmas thick, obtuse, yellow.

A native of Jamaica, where it is esteemed one of the best timber-trees. 12. C. flavescens. Poir. 9. Aubl. 1. 236. tab. 89. (C. farinosa; Linn. Ill. 1907.) “Leaves ovate-oblong, acuminate, smooth, quite entire; racemes lateral; drupes obtuse.” A shrub, producing from the roots several woody, farinaceous stems, eight or nine feet long, spreading upon the neighbouring plants and trees. Leaves alternate, petiolated, armed, reticulately veined, six or seven inches long, and three broad. Flowers yellowish, in lateral racemes, on a rather long common peduncle; calyx with five or six deep, round, acute divisions; corolla funnel-shaped; tube enlarged above the calyx; border with four or five round, spreading lobes; filaments five or six; anthers arrow-shaped; germ greenish. Drupes purplish; but not enveloped with a dry and firm membrane. Seeds affording a glutinous matter. A native of Cayenne and Guiana. 13. C. flavaefida. Linn. Mart. 256. Mart. 2. Lam. 1904. Poir. 10. Wild. 4. “Leaves egg-shaped, acute, serrated, februous; petioles becoming thorns.” Branches stiff, erect, tomentose, ferruginous. Leaves alternate, tomentose undercurrent; petioles very short, jointed, breaking off at the joint when the leaves fall, the part that remains sharpening into a thorn, as in volkameria. Flowers in axillary, simple, or bined racemes, equal in length to the leaf; calyx campanulate, with five obcure teeth; corolla campanulate, five-toothed, twice the length of the calyx; filaments acute. Drupes black, fleshy, about the size of gooseberries. 14. C. toquense. Lam. 1911. Poir. 12. Wildl. 10. Aubl. Guian. 1. 228. tab. 90. “Leaves cordate-ovate, acuminate, quite entire, villous; racemes compound.” A much-branched, spreading shrub, five or six feet high; branchlets brittle, villous, cullet. Leaves from four to six inches long; three or four broad, alternate, nearly sessile, rough and villous above, tomentose and pale green underneath. Flowers white, in axillary and terminal racemes; common peduncle long, villous leaves; calyx about tubular, five-toothed; tube of the corolla short; border spreading, with five roundish lobes; filaments five; filaments the length of the corolla; germ a little villous at the base. Drupes yellowish, fleshy, one-celled. A native of Guiana. 15. C. macropythia. Linn. Sp. Pl. 4. Mart. 5. Lam. 1901. Poir. 13. Redoute Pit. Mus. Par. Annals of Museum of Nat. Hist. vol. 1. Annals of Botany, 1. 127. (Colococoeus platyphyllus; Jam. Bot. 168. Prunus racemosa foliis maximis; Sloan. Jam. 184. Hist. 2. 130. tab. 221. fig. 1.) “Leaves ovate-oblong, villous, veined, very large; racemes forming a corymb; calyx cup-shaped.” A tree from forty-five to sixty feet high. Trunk never more than sixteen inches thick; branches cylindrical, villous while young, several times two or three forked, diverging, and declined towards the earth. Leaves from fix to thirty inches long, from three to seven broad, alternate, deflected, clothed with short rough scabrous hairs, entire, or edged with small sharp teeth; nerves obliquely transverse, prominent underneath; petiole short, cylindrical, channelled. Flowers white; calyx oval, villous, with five upright, straight, obtuse teeth; tube of the corolla cylindrical, entirely villous; segments of the corolla cylindrical, deflected, a little curled, rounded at the tip; filaments five, longer than the corolla; anthers velluteous, with two cells separated at the base, and attached to the filaments by their backs; germ oval, acute. Drupes red, fohbical, about the size of a pea, two-celled. A native of Jamaica. 16. C. jibic. Linn. Sp. Pl. 3. Mart. 3. Lam. 1898. tab. 96. fig. 1. Poir. 14. Wildl. 5. Bot Mag. 794. Bot. Rep. tab. 157. (C. folis fibre pandis; Jacq. Amer. 42. C. acaulis juglandis folio; Plum. Gen. Amer. 150. C. folis amphiobius; Brown Jam. 202. Sebeleinon scabria; Dill. Eth. 341. tab. 355. fig. 331. Caryophyllus sp. Lam. 1913. Hift. 2. 25. tab. 64. Catesb. Car. 2. 91. tab. 91. Novellia nigra; Kump. Amb. 2. 226. tab. 75. Brown Fl. Ind. 509.) “Leaves egg-shaped, somewhat repand, februous; calyx cylindrical.” A shrub from seven or eight feet high. Stems several, erect, smooth, cylindrical, branched. Leaves alternate, on short petioles, slightly repand when young, the older ones more or less repand, the upper ones entire. Flowers deep yellow or scarlet, in large terminal racemes; pedicels one, two, or three-flowered, calyx with three divisions near the top; corolla funnel-shaped; border with five oval, obtuse, crenulate divisions; filaments five; filaments recurved. Drupes inversely pear-shaped; nut deeply furrowed. A native of the East and West Indies. It is not improbable that the above quoted synonyms refer to more than one species; but no b-tamit has hitherto found sufficiently discriminating specific characters. The East Indian plants have yellow, the West Indian scarlet flowers. 17. C. aficonta. Lam. 1896. (C. sebeleinon 3; Poir. Wildl. Sebeleinon alpinus? Lam. Wanzey; Bruce’s Travels, 5. 57, with a figure.) “Leaves roundish-oval, entire; panicle terminal; calyxes top-shaped; nut of the drupe triquetrous.” A tree. Trunk dividing into four or five thick branches, about three feet and a half from the ground. Flowers snow-white, fleshy, entire, and folded back at the margin. A native of Abyssinia. 18. C. aficonta. Wildl. 6. Forst. Prod. 1909. “Leaves egg-shaped, acuminate, rough; flowers in cymes, wrinkled.” A native of the island of Tangatou. 19. C. dichotoma. Wildl. 7. Forst. 110. “Leaves oblong-egg-shaped, scarcely crenate; corymb dichotomus.” A native of New Caledonia. 20. C. fabrifolia. Poir. 16. “Leaves ovate lanceolate, obtuse, wrinkled, very rough, reticulately veined underneath; racemes lateral.” Branches smooth, fritated, cinereous, or yellowish, somewhat pubescent when young. Leaves two inches long, one inch broad, alternate, very firm, coriaceous; pedicels two or three links long, short, firm, rough. Racemes fleshy, villous, beset with whitish hairs. Native country unknown. (Described by Dupuis de Jussieu, and preferred in his Herbarium, 21. C. dingenieri.) “Leaves egg-shaped, entire, rough, whitish underneath; panicle terminal; calyxes cylindrical.” Branches dark brown, thick, angular, very rough. Leaves from fix to eight inches long, four or five broad, alternate, thick, coriaceous, cr日ted, reticulately veined; pedicels almo st cylindrical, short, thick, very rough. Flowers in panicked racemes, shorter than the leaves; racemes unequal, equal, cylindrical, fleshy, sebruous, a little pubescent; pedicels one-flowered. A native of St. Domingo. 22. C. levioca. Lam. Ill. 1912. Poir. 18. “Leaves egg-shaped, veined, shining; panicles lateral; filaments villous near the base.” Branches flender, filiform, cinereous, cylindrical, knotty. Leaves alternate, petiolated, rather small, quite entire, obtuse, or a little acute, narrowed at the base, coriaceous, smooth on both sides, reticulately veined. Pedicels short, but longer than the leaves, smooth, branched; calyces smooth, short, fritated; corolla open, somewhat campanulate; border five-lobed. A native of the West Indies. 23. C. sanguines. Jaff. MSS. Poir. 19. “Flowers tetrandrous; leaves membranous, egg-shaped, acute, smooth; racemes short.” A tree about twenty feet high. Branches dark brown, flender, cylindrical, quite smooth.
CORDIA.

Smooth. Leaves alternate, four or five inches long, about three inches broad, thin, nerved, and rectically veined; petals two in each, long and more, smooth, compressed. Flowers in panicled racemes, scarcely longer than the petals; pedicels very short, one-flowered; calyx with three divisions; corolla with four divisions half way down. Brought from Senegal by Adamson. 24. C. exalata. Lam. t. 190. Poir. 21. "Leaves egg-shaped, acute at the base, rough; corymb terminal; flowers quinquefoliata." A large tree. Branches smooth, fringed. Leaves about four inches long and two broad, alternate, quite entire, obtuse, somewhat acuminate, cuneate, almost shining; petals very short, fringed, lightly compressed. Corolla a little longer than the leaves; pedicels very short, thick, one-flowered, calyx short, smooth, campanulate, with five small acute teeth. Drupes globular, the size of a pea, two-celled. A native of Guiana. 25. C. nervosa. Lam. t. 1906. Poir. 23. "Leaves alternate and opposite, ovate-oblong, acuminate, nervet; petals short; bracts awl-shaped." A tree. Branches cinerifera, thick, angular, rough. Leaves from eight to ten inches long, four or more broad, alternate, entire, smooth, deep green and shining above, pale yellow underneath; nerves strong, oblique, parallel, a little branched or confluent towards the edges of the leaf; petals very short, thick, knotty at the base. First divisions of the panicle almost dichotomous; branches short, thick, almost woody, smooth; calyxes smooth, with five short oval divisions. A native of Guiana. 26. C. rotundifolia. Poir. 23. Ruiz. and Pav. Flor. Peruv. 2. 24. tab. 148. Prunas Sibilla; Piek. Almog. 306. Phytog. tab. 217. fig. 2. "Leaves roundish and oval, crenate, furrowed; peduncles corymbiform." A shrub about twelve feet high. Stems straight, often almost procumbent; cylindrical; branches numerous, very long, fleshy, 212-zag, villous when young. Leaves from two to three inches long, and two broad, alternate, petioled, wrinkled, veined, rough, rather hispid. Flowers yellow, large; calyx tubular, fringed, with five short acute teeth; corolla funnel-shaped; tube the length of the calyx, dilated at the orifice; border with five plaited, oval, acute divisions; filaments awl-shaped, villous at the base; anthers oval-oblong, concave; germ oval, acuminate; flyle the length of the flaments. Drupes whitish, half enveloped by the calyx and a viscid pulp; nut oval, acuminate, five-furrowed, two-celled. The fructification often varies from six to eight in the number of its parts. A native of Peru, in dry sandy ground, and by the sides of the roads. 27. C. dottata. Poir. 24. "Leaves egg-shaped, angularly-cut, toothed; pedicle dichotomous, large, divaricately, branches petioled, hispate." Branches a little zig-zag, brown or cinereous, cylindrical, rough, clothed with short fuscous hispate hairs. Leaves from three to five inches long, from two to four broad, alternate, rough with small whitish points and deep green above, paler and yellowish underneath; some feebly toothed, others moderately cut, a little angular, with short acute teeth; nerved and reticulately veined; petals about an inch long, slender, cylindrical, villous. Flowers white, almost campanulate; pedicle terminal; ramifications numerous, growing gradually shorter, fuscous, pubescent; pedicels very short, one-flowered; calyx short, almost campanulate; tube of the corolla short, dilated at the orifice; border large, very open, with five or fix small lobes. A native of Cuba. 28. C. micranthus. Mart. t. 11. Poir. 25. Wildl. 12. Swartz. Prod. 47. Flor. Ind. Occid. 1. 493. "Leaves elliptic, acute, entire, membranous, veined; racemes compound, loose." Branches corymbose, a little twilled, wrinkled, smooth. Leaves alternate, coria-
of polts, or an imaginary line of separation, between two
armies either in the field or in winter-quarters, or for cov-
ering a particular frontier or tract of country.

CORDON, in Geography, a small island in the Pacific
ocean, near the west coast of Nicaragua, at the entrance of
the bay of Rincão.

Cordon-Jaume; the order of, or of the yellow flaring, in
France, was instituted by the Duke de Nivers in 1606, and
abolished the same year by Henry IV. of France.

Cordina, in Ornithology, a name given by Buffon to the
Ampelis caudata of Gmelin, and the purple-breasted chas-
ter of Pennant and Latham.

Cordon, in Geography, a mountain of Valencia in Spain, is
competed entirely of rock salt, 4 or 500 feet high and about 3 miles in circumference: Mr. Bowles informs us, that there are no traces of gypsum near this mountain, as in most similar instances it is the case.

In the climate of Spain, this mass of salt remains undif-
folved by the rains, or the waters of a river which washes it. Mr. Trowedland carried a fragment of this salt with him through Spain, without the least sign of deliquescence, but on his return to England he soon found it surrounded by a pool of water, owing to the coldness and humidity of our atmosphere. In Spain this rock-salt, like the flour-
spars of Derbyshire, is employed to make flour-boxes, vases, and other ornaments and trinkets.

CORDOVA, ADRIANO OF, in Biography, is called from the
place of his nativity, a considerable town in Spain,
was a barefooted Carmelite who applied himself to horti-
cultural practice with success. It is regretted, however, that from a too great modesty or diffidence of his own powers, he was induced to debase so many of his pictures as soon as he had finished them. The few that remain are at Cordova, the most remarkable of which is a Crucifixion with St. John, Mary Magdalene, and other figures of half length, in the manner of Rafael Sadeler, in the convent of the Carmelites. This artist died at Cordova in the year 1630.

Cordoba, or Cordona, in Geography, a city of An-
dalusia in Spain, forming a kind of semi-circular amphitheat-
tre on the right bank of the Guadalquivir, in an exten-
sive and fertile plain at the foot of a range of mountains,
named the Sierra Morena, 84 miles N.E. of Seville; it is
N. of Malaga; 210 S.W. of Madrid, in N. lat. 37° 40'.

It is the ancient Cordoba, the first Roman colony in Spain, and probably on that account called Colonia Patricia, or simply Patricia, as appears from an inscription on an antique marble in the church of St. Marina:

D. M. S.


Pius in Suos. H. E. S.

Sit T. T. Levi.

Cordova has been styled the mother of men of genius.
From the very foundation of this city it was the fear of
learning and sciences. Strabo says, that the ancient books of the Tarde, their poetry, and their laws written in ver-
de, were preserved at Cordova. Its academy was celebrated
for rhetoric and philosophy; it had also a Greek profes-
sofficer. The elder Seneca, and Lucius Aemilius Seneca, pre-
ceptor to Nero, were born at Cordova, as well as Lucan
the poet, whose grandfather Aemius Lucas, celebrated for
his eloquence, flourished here. So did Gallo, another fa-
mous orator; Portius Lidura, of whose works there re-
 mains one harangue; and Maximus, master of the elider
Seneca. Tully, in his oration for the poet Archias, men-

tions several poets of Cordova who were established at Rome among others, Sextilius Henna, of whose writings there is only one elegy extant, in which he laments the death of the Roman orator.

After the fall of the Roman empire, Cordova was subject to the dominion of the Goths, until the Gothic monarchy of Spain was overthrown by the Saracens, under the command of Tarik. A Roman captive and profligate who had been enfranchised by the caliph of Damascus, assassinated Cordova with seven hundred horse. He surprised the town, and drove the Christians into the great church, where they defended themselves above three months; and of all the Spanish military chiefs the governor of Cordova is recorded as the only one, who fell, without conditions, a prisoner into the hands of the Saracens.

Abdelaziz, the son of Mulia, to whom the administration of Spain, under the caliph of Damascus, was confided, conceived the design of erecting an independent throne at Cordova; but no sooner was a suspicion of his intentions diffused than a powerful conspiracy was formed against him. As he was repairing alone to the mosque of Cordova, he was attacked and murdered by the conspirators.

On the assassination of Abdelaziz, Ayyub assumed the administration of Spain. He was soon removed by the superior favour or merit of Alahor, who, like Abderez, one of his succedors, vainly attempted the conquest of the west.

Under twenty successive lieutenants of the caliphs, Spain, imbued, in a few generations, the manners of the Arabs; and by assuming the name of Spaniards, the Arabs affected their original claim of conquest.

In the meantime the rival houses of Ommiiah and of Abbad, the uncle of Mahomet, contented the East by their pretensions, from the Indus to the Euphrates. Their contest was decided on the banks of the Zeb. Mervan XIV., and last caliph of the house of Ommiiah, was forced to yield to the enthusiasm of the Abbasides, conducted by Abdullah the uncle of his competitor. The vanquished caliph crossed the Euphrates, and without halting in Palestine, pitched his last camp on the banks of the Nile, where he was attacked by Abdullah, and the lance of an Abbasid terminated the reign and life of Mervan.

In the proscription of the Ommiades, a royal youth of the name of Abdallah was alone escaped from the rage of his enemies, and was received on the coast of Andalusia with open arms. The Arabian chiefs, who reverenced the memory of the immediate successors of Mahomet, drew their fables in his support. The defeat of the Zeb was avenged on the banks of the Guadalquivir; that river was fortiied with the bodies of the slaughtered Abbasides; and the throne of the victorious Abdallah was established at Cordova in the year 755 of our era.

During a prosperous reign of thirty years, Abdallah, encouraged agriculture, commerce, and the arts. Cordova became the centre of industry, of politeness, and of genius. His son Hassen, who succeeded him, not only patronized, but was even a proficient in the arts. He fulfilled the famous mosque, which had been begun by his father, and threw over the Guadalquivir a bridge which remains a lasting monument of his skill.

Under the second Abdallah a perpetual supply of pure water was conducted through pipes and aqueducts into the heart of Cordova, and numerous mosques augmented its magnificence.

Learning flourished under Alkaham the second. He founded the university of Cordova, and the birth-place of the Senecas, and the Lucans, asserted again its pretensions to literary fame. He collected so immense a quantity of manuscripts, that before the end of his reign the royal library is reported to have contained the almost incredible number of six hundred thousand volumes, of which the catalogue alone filled forty-four folio volumes.

But the pomp of the third Abdallah, who reigned from the year 912 till 961, appears still more incredible. His wives, concubines, and black eunuchs, amounted to fifteen thousand persons. He was attended to the field by a guard of twelve thousand horse, whose belts and feathers were studded with gold. To perpetuate the name of his favourite Sultana, he constructed, three miles from Cordova, the palace and gardens of Zebra or Arizapha. The edifice was supported by above a thousand columns of the finest marble; the walls of the hall of audience were incrusted with gold and pearls. A formidable army secured the prosperity which his dominions derived from his wife administration. The royal city of Cordova contained six hundred mosques, nine hundred baths, and two hundred thousand houses. Eighty large cities, three hundred towns, and twelve thousand villages obeyed his sway, and yet, in less than fifty years after his decease, the kingdom of Cordova was dissolved, and the house of Ommiiah overwhelmed.

His son, Alkaham the second, whom we have already mentioned as the founder of the university of Cordova, died in 976, and left the throne to Hassam his son, a feeble infant, and the reins of administration to the celebrated vizir Mahomet Abenamir, who from his valour acquired the surname of Almanzor or the Defender. He successfully struggled against civil and foreign commotion, and at his death, his renown was respected in his descendants. The office of vizir became hereditary in his family. His son ruled with a power as absolute as that of the caliphs; their insolence provoked the ambition of other chiefs; the exclusive pretensions of the house of Ommiiah were disregarded, the grandson of the great Abdallah was plunged into a dungeon, and the glory of the throne of Cordova, which under the Ommiades had shone with such a lustre, during a little more than two centuries, was overshadowed by a long night. The limits of the Saracen dominions gradually receded. Several petty principalities were formed on the ruins of their empire, which was at length confined within the boundaries of Granada.

In the mean time the university of Cordova preferred for a long period of years the reputation which it had acquired under Alkaham II. It was at Cordova that Avenpace and Algazel, two figures mentioned by St. Thomas, taught moral philosophy; that Alial Cohacen and Abeein Rezel acquired their profound erudition; and that Abouvaliz, the great astronomer and physician, furnished the Wise, received his education. Within its walls were formed those thirty philosophers and physicians, who arranged the works which, under the name of Avencana, were dedicated to prince Ga
dara, to whom they have been falsely attributed.

Among the learned Moors, to whom Cordova gave birth, are Abheimarac, Abramo, Mefulco, Rebez Almanzor, known by a number of curious works, and a history of the conquest of Spain, Aben Rezel who likewise wrote on the division and conquest of Spain, and Averroes, called, by way of eminence, the commentator.

Cordova has preserved nothing of its ancient grandeur, except a vast enclosure filled with houses half in ruins. Its population from 300,000, which it was in the time of the Moors, is reduced to 15,000. Its long, narrow, and illu

Cordova.
The bishop of Cordova is suffragan of the archbishop of Seville. His annual income exceeds 5000l. St. Raphael, the patron of Cordova, has a magnificent gilt statue at one of the gates, which forms a singular contrast with the wretchedness that reigns within the town.

The only remarkable edifice of Cordova is its famous cathedral, which formerly served as a mosque to the Moors, and still retains the name of Mezquita. It forms a long square of one hundred and fifty-eight paces by one hundred and thirty-eight, and is well lighted, but too low. About six hundred columns of blackish marble placed in Quemex are well preferred; but they do not reach the ceiling; they are made with the outlines in twelve feet high, and have neither base nor capital; they are joined to each other by two arches placed above the other, covered with plaster, and supported with stone work whitened over. The result of the whole is not altogether agreeable to the eye, and the cathedral is more remarkable for its oddity than for any very striking beauties, though nothing would equal its magnificence were the height proportioned to the extent. Its exterior presents only a minute and irregular edifice with enormous square pillars.

By the side of the cathedral is a small grove, the fascinating remains of the taftful luxury of the Moors. It is planted with orange-trees, the tufted foliage of which serves as a asylum to great numbers of birds, and hangs over several fountains which constantly cool the air.

The ancient palace of the Moors has been converted into stables, in which one hundred flailors are usually kept. Their genealogy is carefully preserved; the name and age of each are written over the stall in which they stand. The beautiful horse of Cordova is reckoned the most perfect. There is a curious manuscript in the Escorial marked D.CCC.XCVII on horses and horsemanship, written by a Moorish prince, and dedicated to the third king of the family of Benewfet, who reigned in the year 1501.


Archbishop Roderic Ximenes, in his "Historia Arabum," informs us, that Cordova was paved to early as the middle of the ninth century, or about the year 850, by Abdalrahan II. the 4th Spanish caliph. This prince, who knew the value of the arts and sciences, and who favoured trade so much, that in his reign abundance prevailed throughout the whole land, caused water to be conveyed into this city, which was then his capital, by leaden pipes, and ornamented it with a muque, and other elegant buildings.

Cordova, a province of South America, being, by the new division of 1782, an intendency of the viceroyalty of Buenos Ayres, about 100 leagues in length, and 70 in breadth, intersected by several chains of mountains, and watered by several rivers. This district is chiefly celebrated for woollen manufactures, being fostered on the eastern side of a grand and high branch of the Andes.

Cordova, a neat clean town, in the above-mentioned district, distant 150 miles from Buenos Ayres, and pleasantly located at the foot of a high and wooded ridge. The town was founded about the year 1550, by Juan Nunez de Prado; and in 1570 erected into an episcopal see. Its chapter consists of the bishop, dean, archdeacon, chapter, rectors, and treasurer; but it has neither canons nor prebendaries. Cordova is situated between the river Primero, so called because it is the first of five in the neighbourhood, which flow in the same direction, and a hill, on a level but sandy soil, so that the rains speedily pass, though the vaults be unwholesome. The city approaches a square form; but the cathedral is irregular, from the want of symmetry in the towers. There are many good and strong houses in the city, but seldom high, though the roofs be elevated; and there are three convents, and two colleges, one of which the Franciscans have absurdly filied the university. Few places of equal extent can display equal wealth; all the inhabitants, Spaniards as well as Creoles, being noted for activity and industry. The chief trade is in wools, which are brought from the southern provinces; and having fed them in the fields, they conduct them to the fair of Salta, where they are sold to merchants from Peru, at 8 or 10 dollars each; but some fend them, on their own account, to be sold in the Peruvian markets, the value being proportioned to the distance. The inhabitants may be 6000; and the houses, mostly of different mixtures, do not procure their freedom so easily as in other parts of America. As meat is very cheap, and the were weave and make their own clothes, they are at once cally maintained, and very useful; nor do they wish for freedom, being neither fatigued nor oppressed. The female faves are excellent washer-women, and go into the river with the water above their middle; nor are they deficient in other kinds of industry. The ladies of Cordova are neatly clothed, and careful observers of the customs of their ancestors; whence the faves are not permitted to wear any cloth but that manufactured in the country. The wine, and a considerable part of the grain, are procured from Mendoza; while brandy is brought, in leather bags or bottles, from S. Juan de la Frontera, 30 leagues to the N.W. of Mendoza, on the northern extremity of the province of Cuyo, N. lat. 31° 30'. W. long. 63° 15'.

Cordova, Mountains of, are a chain passing N. and S. on the W. of this province, regarded by some as a branch of the Andes, and said to be covered with perpetual snow. These mountains, according to Helms, sometimes present red and green granite, and gneiss, while the grand chain of the Andes consists of argilaceous schistus. As the ridge of mountains becomes gradually higher, the population increases; but at Ramonfs, 60 miles from Cordova, they again branch, and so far from one another, that from that place to Tucuman the traveller passes through a saline plain, 70 Spanish miles in length, and for the most part barren and defert, from which the mountains are seen at a distance. The whole ground is covered with a white incrustation of salt; and bears no plants except the "saldia salt," which grows here to the height of four Parian yards. The decayed town of "St. Jago de Eterno" is situated in this plain.

Cordova, a considerable town of North America, in Mexico, the whole district of the trade being fugar, for which it has 33 mills. Estalla says, there are 260 families of Spaniards, 126 of Melizos, and 273 of Mexican Indians. Thierry describes Cordova as a large town, with numerous domes, towers, and steeples, and a large square in the centre, with
with Gothic arcades on three sides, the cathedral filling the fourth, and a fountain of delicious water in the middle. The streets are wide, straight, and paved, and the houses mostly of stone; but the inhabitants are indolent. The situation is in a kind of natural passage towards the province of Mexico; the vegetation being rich and beautiful, on a soil of red clay, from 10 to 15 feet in depth, producing all the fruits of the two hemispheres. N. lat. 15° 15'. W. long. 97° 40'.

CORDOVA. See CORDUMA.

CORDOUAN, the Tower of, an extremely well-con- structed pharos or light-house, at the mouth of the river Gironde, in France; 66 miles N.W. of Bourdeaux, and 15 miles S.W. of La Rochefit. In N. lat. 45° 35' 15'. It was built by Louis XIV. in the year 1665. The formidable mats of rocks on which it stands is formed by the reefs that flit the shore. The tower itself is 100 feet high, the great lantern 15; and from 200 to 350 pounds of pitch are consumed in it every night. The watchmen are generally relieved every fortnight: they take care, however, to provide themselves with at least one month's provisions, because the boats cannot approach the reefs but when the sea is perfectly calm. F. A. Fisher's Travels in Spain, Letter vi.

CORDUBA, CAVR. FRANCESCO, in Biography, a painter and engraver of Italy, by whom we have a set of 44 etchings, medallion sized upright plates, from the fountains in the gardens about Rome, engraved by figures much in the style of Callot. He marks his plates thus: "Eques Franc. Corduba del et Sculp." Strutt. Heineckon.

CORDUBA, in Botany, Cluf. See Asparagus albus and Aphyllus.

CORDURA, now Cordova, in Ancient Geography, a town of Spain, S.E. of Mallaria, upon the river Buclus. It was in this town, as Strabo informs us, that the Romans fixed their habitation, when they first entered Spain. But if it be true that it was founded by Marcellus, as Strabo himself says, we are led to imagine, that from the time when the Romans first inhabited it to the period when Marcellus conducted a colony hither, it could not have been very considerable. However, Silius Italicus says, that it suffered from the time of the second Punic war. However this be, it was from the epoch of Marcellus that it bore the title of a patria colonia, from his having establish'd in its families of this order. Corduba was the first place which the Romans had in Spain, distinguished by the epithet of Cordubata, and with the privilege of coinage money. It afterwards became so considerable, that Strabo compares it with, regard to its commerce, with Gades; and he also extols the extent and fertility of the adjacent country. It was no les celebrated for its literary reputation, as it was the residence of the two Sene'ces, and of the poet Lucan. On some medals, bearing the name of Corduba, we see on one side a well-dressed female head, and on the other a winged figure, holding a cornucopia; but the greatest number of medals belonging to this city are inscribed with "Colonia Patricia." It is probable that it was called by the first name before the establishment of the colony, and afterwards by the other. See Cordova.

CORDUENA, a town of Armenia. See CORDESE.

CORDULA, or Cordyla, Portus, a port of Asia in Pontus, upon the Euxine sea, according to Arrian, who places it between mount Sacer and Hermaphassa, S.E. of Trapezus.

CORDUS, or Sordus, the name given to an ancient people of Gallia Tarragonensis, who dwelt in the vicinity of the Pyrenees, upon the coast of the Mediterranean sea.

CORDUS, Aulus Cornelius, in Biography, a senator and historian of Rome, during the reigns of its first two emperors. In his history of the civil wars, and of the reign of Augustus, he refers to C. Caius, and designates him "the last of the Romans." For this offence he was impeached, and put on his trial; during which he manfully vindicated his cause, and in his defence exclaimed, "Pettority will pay to every man his due honour, nor, if I am condemned, will there be wanting those who will cherish the memory, not only of Brutus and Caius, but of me also." This was not the effusion of an envious spirit, but the confidence to which his virtue and talents gave him a just claim. His prediction has been abundantly fulfilled; and it adds us pietate, at the distance of nearly two thousand years, to record the heroism of a man who disdained to fear the arm of power, and who held in contempt the tyrant Scipio, whose name has descended with so much infamy attached to it, as that of Cordus has with unfulfilled honour. For seeing that he should be condemned by the tribunal appointed to hear his cause, he resolved to put an end to his life, by abstaining from his daily food. On the fourth day, finding himself well naught animated by hunger and debility, he sent for his beloved daughter, Marcia, from whom he had conceal'd his intention, and, embracing her with tender affection, apologized for keeping this only secret from her, adding, "I am now half-way on the road, and you neither ought to call me back, nor can do it." She departed: and while his accusers and judges were debating what course to pursue, he breathed his last in peace. The senate ordered his books to be burnt; and though some copies were spared, which his daughter caus'd to be made as public as possible, yet nothing now remains except an epitome of Cicero, preferred in the Sabinia of M. Seneca. Of their value an estimat may be formed by the character given of them by Seneca. Speaking to Marcia, he says, "You have well deferred of Roman literature, and of piety, to whom will defend a faithful record of events, which cost the author so dear: you have well deferred of himself, whose memory will live and flourish, as long as it is thought worth while to know the history of Rome; as long as there shall remain any one, who shall wish to recur to the acts of his ancestors, any one who shall be defierous of knowing what a Roman once was: what, when all necks were bowed beneath the Spanian yoke, was the character of an unconquerable spirit, free in his head, his heart, his hands." Rom. Hist.

CORDUS, RURICUS, by Melchior Adam called Henry Urban, celebrated for his skill in medicine and in poetry, was a native of Simmerghays in Hesse. To attit himself in the profession of his studies, he employed some of his early years in instructing the sons of some of the neighbouring gentry. In performing this office, he had the good fortune to attract the notice of Eranus. In 1521 he went to Italy, where he attached himself in a particular manner to the study of botany; collecting and examining a number of rare plants, and diligently comparing them with the descriptions of them left by Dioscorides. At Ferrara he took the degree of doctor in medicine, which he afterwards taught at Erfurt and Marburg. In 1535 he went to Bremen, where he spent the small remainder of his life, which terminated, when he was only of a middling age, in the year 1538. He was author of several, and some very valuable, works. His "Treatise on the English Sweating Sickness" was published at Tifour, in 1529, 4to; and in 1532, he gave a Latin version
Cordula, in Ichthyology, an American fish, the Scooter cordula of Gmelin, the Gurna teres of Maregrasse, and the Trachurus brevifrons of Ray.

Cordylene, in Botany, a herb. See Dracena dress, and Yucco gloriosi et arizonis.


Gen. Ch. Cal. four-leaved, caduncous; leaves linear, nearly close. Cor. four-petalled, cruciform, open; style the length of the calyx; border ovate, quite entire. Stam. Filaments fex, erect, filiform; two lateral ones shorter; others almost erect, small, oval. Petic. Germ superior, cylindrical, smooth, ovate at the upper end; style very short; stigma obtuse. Pcrie. Silique jointed; the leaf joint dilated, globular, ovate, terminated by the permanent style. Seeds several, convex, somewhat compressed, oblong.

Eff. Ch. Calyx nearly close. Silique cylindrical, jointed; the leaf joint more distinctly separated.

Sp. 1. C. minuta, Point. in Encey. 1. Willd. 1. Des. Atl. 2. 72. tab. 152. "Silique one-celled, spreading; leaf joint muricate; leaves partly lyrate." Root annual. Stems about two feet high, erect, scabrous, hispid, especially on the lower part, slightly fruticose, branched; branches alternate, axillary. Leaves smooth, or clothed with a few dilatant hairs; lower ones oblong, or elliptical, decurrent; some quite entire, others lyrate; upper ones lanceolate, alternate, slightly fruticose, or a little toothed. Flowers alternate, almost sessile, in a terminal raceme; calyx smooth, or somewhat villous, coloured; corolla pale yellow. Silique smooth, or a little villous. Seeds four or five. Discovered by Desfontaines about Mayane, in the kingdom of Algiers. C. 2. levigata, Willd. 2. Pot. 2. (Smapi graciew; Tourn. Cor. 17. Lt. 1. 398. tab. 35.) Eucam. aleppica; Gent. 258. tab. 143. f. 9. Vent. Jard. de Cels. tab. 64.) "Silique two-celled, prefl; terminal joint smooth; leaves pinnatifid. Stems a foot high, erect, quite smooth; branches alternate, widely spreading. Leaves somewhat flat, alternate, smooth, peltate; segments linear, cutine, channelled. Flowers in terminal upright racemes; corolla purple, or pale red. A native of the island of the Archipelago.

Cordylus, in Anciout Geography, a town of Asia, placed by Step. Byz. in Pamphylia.

Cordylus, in Zoology, a species of lizard, the Lacerta cordylus of Gmelin and Linnaeus, with a short verticillated tail, dentilate scales, and a smooth body. It is found in Asia and Africa. Its body is livid or blackish.

Core, in Rural Economy, a name applied to a disorder incident to sheep, occasioned by the presence of small flat worms inserted in the liver. The greatest chance of removing this complaint is by changing the sheep into a more airy and dry pasture.—It also signifies the heart of the wood of trees, and likewise of some sorts of fruit, as the apple, pear, 

Core Bank, in Geography, a narrow island of America, on the coast of N. Carolina, about 40 miles long, and scarcely 2 broad. N lat. 34° 22' to 31° 55'. W. long. 75° 26' to 76° 50'.

Core Sound lies on the coast of N. Carolina, south of, and communicating with, Pamlico.

Corea, or Corea, in Ancient Geography, a place at which Pallas commenced on the northern side, according to
to Josephus; who says it was near Scythiopolis and a fortress named Alexandrium.

Corea, in Geography, called by the Chinese Kao-li, and by the Mantehew Tartars Solbo, a kingdom of Asia, in the form of a peninsula, extended between China and Japan, and every where surrounded by the sea, except towards the north, where it is connected with Chinese Tartary, which bounds it on the north; it is bounded on the east by the sea and islands of Japan; on the south by the straits of Corea, separating it from Japan, and by the ocean; and on the west by the Yellow sea, which parts it from China. This kingdom is commonly reckoned to be 200 leagues in length from N. to S. and 100 in breadth from E. to W. The great number of shoals and headlands which surround the coasts of this peninsula, render access to it by sea equally dangerous and difficult. Its least distance from Japan is only 25 leagues. The origin of the Coreans is very obscure. It appears, however, that this peninsula was at first inhabited by different tribes, which composed several states; and that, in course of time, they united under the same government, and formed one kingdom, which was called Kao-li. The Coreans were most probably of Tartar extraction. This kingdom is governed by a sovereign, who exercises absolute authority over his subjects, although he himself is a vassal and tributary of the emperor of China. On every succession to the crown, the prince receives on his knees the investiture of his flates, granted, or at least, confirmed by the emperor, and distributes among the emperor's envoys the sum of 800 tails, and several other customary presents. The minister of Corea afterwards repairs to Pe-king, to profest himself before the emperor, and present him the tribute. The princes, who has crowned the king, cannot assume the title of queen, until she has received it from the court of Pe-king.

The Japanese conquered this kingdom about the end of the 16th century; but the Coreans, assisted by the Tartars, who had subdued China, drove them from their country. The Mantchews, thus masters of Corea, endeavored to compel their new subjects to shave their heads, after their manner, and to adopt the Tartar dress. This innovation irritated their minds, and occasioned a general revolt throughout the kingdom of Corea, which was at length appeased by the prudent attention of the reigning family. The interior geography of this kingdom is little known: we are informed, however, that it is divided into eight provinces, containing 490 districts, 33 cities of the first class, 5% of the second, and 70% of the third. King-kita, or Kinko-tau, situated in the province of King-hi, is the capital of the whole kingdom, and the ordinary residence of the sovereign. This prince is absolute master of all the wealth of his subjects, which he inherits after their death. He is very rigid in the administration of justice; and particular punishments are appointed for murder, robbery, and adultery. Every seventh year all the freemen of the different provinces are obliged to go to court in rotation, and to keep guard round his person for two months; so that, during this year, the whole country is in motion and under arms.

The Coreans are well-formed, ingenious, brave, and tractable. They are fond of dancing and music, and particularly dote in acquiring the sciences, which they are said to study with ardor. Men of learning are distinguished from other classes of people by two plumes of feathers, which they wear in their caps. When merchants present any books for sale to the Coreans, they shew their respect by dressing in the richest attire, and burn perfumes before them to treat concerning the price. The northern Coreans are of a larger size, and more robust than those of the south; they are addicted to arms and become excellent soldiers; using, in combat, crossbows and very long fabrics. The Coreans do not inter their dead till three years after their decease; they wear mourning for a father or mother three years, and for a brother three months. When they perform the ceremony of interment, they place around the tomb the clothes, chalices, and horses of the deceased, and any thing else of which he was fond when alive; all which they have to be carried away by those who assisted at the funeral. Their houses consist only of one story, and are very ill built; in the country, they are of earth, in cities, generally of brick; but they are all tinctured with straw. The walls of their cities are constructed after the Chinese manner, with square turrets, battlements, and arched gates. These people have borrowed their writing, dress, religious worship, ceremonies, belief of the transmigration of souls, and the greater part of their customs, from the Chinese. Their language, however, is different. (See CHINA.) Their women are subject to less restrictions than those of China; and they also differ from the Chinese with regard to their marriage ceremonies. In China, fathers and mothers often marry their children without their consent, and even without their knowledge; but in Corea, the contracting parties choose for themselves, nor do they consult the inclinations of their parents, or allow them to interpose any objection in the way of their union. The principal productions of Corea are wheat, rice, and ginseng. This country also produces gold, silver, iron, fossil salt, eulor and fable's skin, a beautiful yellow varnish, the splendor of which is almost equal to gilding, and which diffuses from a tree resembling the palm tree, small horses about three feet high, and white paper. Small brushes for painting are made here of the hair of a wolf's tail, which are much esteemed in China. The paper of Corea, of which a considerable quantity is annually imported into China, is made of cotton; it is as strong as cloth, and those who write upon it make use of a small hair brush or pencil; without the precaution of rubbing it over gently with a little alum-water, it would not bear the ink of European pens. With this paper the Coreans partly pay the tribute due to the emperor, supplying the palace with it every year. The Chinese purchase it, not for the purpose of writing, but for filling up the figures of their fan-windows, because, when oiled, it resists the wind and rain much better than theirs; they also use it as wrapping-paper; and it is likewise serviceable to their tailors, who rub it between their hands till it becomes as soft and flexible as the finest cotton cloth, instead of which they often employ it in living clothes. If it be too thick for the purpose intended, it may be easily split into two or three leaves; and these leaves are even stronger, and less liable to be broken, than the best paper of China.

The sea-coasts of Corea abound with fish; many whales are found there every year towards the north-east, several of which, it is said, bear in their bodies the darts and harpoons of the French and Dutch, from whom they have escaped in the northern extremities of Europe. If this be true, it seems to indicate the existence of a passage from thence into the seas that lead to the north of America. We refer the reader for farther information with regard to this country to Du Halde and Groffer.

Corea. Strait of, that part of the sea which separates the southern part of the continent of Corea from the Japanese islands, between N. lat. 32° and 36°, and E. long. 130° and 132°. The channel, 735 Pereauce (Voyage, vol. n. p. 17, Eng. ed.), that separates the coast of Japan from the continent may be 15 leagues wide, but it is reduced to 10 leagues by rocks which interruptely border the southern coasts of Corea, from Quelpaert, and which continued, till we had doubled the S.E. point of that peninsula, to that we
were able to keep very close to the continent, distinguisht
the houses and towns on the coast, and reconnoitre the bays.
We law, says Perouze, on the summits of the mountains some fortifications exactly similar to European forts. It is highly
probable the principal means of defence, employed by the
Corcius, are directed against the Japanese. This part of
the coast is very favourable to navigation, for there appears
no caule of danger; and at 3 leagues in the offing the depth
of water is 60 fathoms over a muddy bottom; but the
country is mountainous, and appears very arid. The snow
was not entirely melted in some hollows (May, 1787); and
the soil seemed but little susceptible of cultivation. The
habitations, however, are very numerous. We counted a
dozcn lampanes, or junkas, failing along the coast, and seem-
ing in no respect to differ from those in China, their fairs
being also made of matting. See Dagelet, Island of
COREATIS, in Ancient Geography, a place of India,
near the mouth of the Indus, according to Arrian.
CORED, in Geography, a town of Egypt; 16 miles N.E.
of Belbeis.
CORED Herrings. See Herrings.
COREGGIO, in Biography. See Correggio.
COREGLIO, in Geography, a town of Italy, in the
state of Lucca; 15 miles N. of Lucca.
COREGONI, in Ichthyology, a division of the SALMO,
including those with fearlessly conspicuous teeth.
COREIA, in Antiquity, a festival in honour of Pro-
pine, named Core, Kote, which, in the Molossian dialect, sig-
nifies a beautiful woman.
CORELLA, in Geography, a town of Spain, in Na-
varre, on the Alhama; 6 leagues from Tudela.
CORELLI, Arcangelo, in Biography. The performance
and compositions of this admirable musician, form an
era in influential music, particularly for the violin, and
its kindred instruments, the tenor and violoncello, which he
made respectable, and fixed their use and reputation, in all
probability, as long as the present system of music shall
continue to delight the ears of mankind. Indeed, this moat
excellent master had the happiness of enjoying part of his
fame during mortality; for scarce a contemporary mu-
cial writer, historian, or poet, neglected to celebrate his ge-
nius and talents; and his productions have contributed long-
er to charm the lovers of music by the mere powers of the
bow, without the aidfulness of the human voice, than thone
of any composer that has yet existed. Haydn, indeed,
with more varied abilities, and a much more creative genius,
when instruments of all kinds are better understood, has
captivated the musical world in, perhaps, a still higher de-
gree; but whether the duration of his faviour will be equal
to that of Corelli, who reigned supreme in all concerts, and
excited undiminished rapture full half a century, must be left
to the determination of time, and the encreased rage of de-
praved appetites for novelty.
Corelli was born at Fugignano, near Imola, in the terri-
tory of Bologna, in February 1653. He is said by Adami
to have received his first instructions in counterpoint from
Matteo Simonelli of the Papal chapel; but the general opini-
on is, that his master on the violin was Giambattista Bai-
fan, of Bologna. It has been said (Life of Handel, 1762,
p. 46.) without authority, that Corelli went to Paris in the
year 1672, but was soon driven thence, by the jealousy and
violence of Lulli. That he returned Germany after he had
finished his studies, we are informed by Gaspar Prutz (Satzk.
Tomponii, &c.) that he was in the service of the duke of Bavari, in 1690. Soon
after this period, he seems to have returned to Italy, and
settled at Rome, where, about 1658, he published his first
"Twelve Sonatas." In 1683, the second set appeared,
under the title of "Balletti da Camera," which, the same
year, gave rise to a controversy between the author and
Paolo Colonna, concerning the diatonic succession of fifths,
between the first treble and the base of the allemand in the
second sonata. In 1699, Corelli published the third opera
of his sonatas; and in 1694, the fourth, which, confounding
of movements fit for dancing, like the second, he called
"Balletti da Camera."
In the works of the poet Guidi, published at Verona,
1727, it is recorded that, in 1686, when our king James
II. poulou sent an ambassador to pope Innocent XI. to
make a tender of his duty as a faithful son of the Romish
curch, at a grand academia which Christina queen of Swe-
den, then a profadyte, and resident in the Alma Città di
Roma, gave on the occasion, the music was composed by
Bernardo Paquin, and the band, amounting to one hundred
and fifty performers on bowed-instruments, instrumeni di
arco., led by Arcangelo Corelli.
About this time, when the opera was in a very flouri-
ishing state at Rome, Corelli led the band as principal violin.
But his folos. the work by which he acquired the great-
eflu reputation during his life time, did not appear till the
year 1700, when they were published at Rome, under the
following title: "Sonate à Violino, e Violone, à Cembalo,
Opera quinta, Parte prima, Parte seconda, Preludio, Alle-
amende, Corente, Gighe, Sarabande, Gavotte et Folhia."
This work was dedicated to Sophia Charlotte, electrefs of
Brandenburg. His great patron at Rome was cardinal
Ottoboni, the general encourager of polite arts and learning,
to whom, in 1694, he dedicates his "Opera Quinta," and
in whose palace he constantly refided, col petto to cará-
tere d' atuaile servitore of his eminence, as he expres-
s himself in the dedication.
Crescitumvini (Comment. della Volg. Poelia, vol. i. chap.
xi. Roma 1702.) speaking of the splendid and majestic acade-
ma, or concert, held at cardinal Ottoboni's every Mon-
day evening, says, that this performance was regulated by
Arcangelo Corelli, that most eminent professor of the violon:
famofissimo professore di violino.
In 1708, we have an honourable testimony of his high
rank in the profession, given at Venice in the first edition of
the "Armonico pratico al Cembalo," by Francesco Gai-
parini, who calls him, "virtuosifimo di violino, e vero Or-
feo di nostro tempo," (cap. vii.) And Adami, in speaking
of Simonelli, Corelli's first master in counterpoint, says,
that he made many scholars, "among whom, the most cele-
brated was the famous Corelli, the chief glory of the age,
with the fame of whose five works, already published, the
world is filled; and the sixth, confisting of concertos, which
he is now (1711) polishing for the prince, will complete his
immortality."
A very particular and intelligent friend, upon whose judge-
ment and probity we have a most perfect reliance, having
had a conversation with Geminiani about five or six years
before his death, and a friend of his at that time having
had in meditation the writing a history of music, he com-
mitted to paper, when he got home, the chief particulars
of his conversation, supposing they might be of some use
to his friend; but as the plan he had in view has been long
laid aside, we have been favoured with the anecdotes and
particulars that were obtained from Geminiani, which, as
they chiefly concern Corelli, and were communicted by one
of his most illustrious scholars, who heard and saw what he
relates; we shall insert them here.
"At the time that Corelli enjoyed the highest reputation,
...
his fame having reached the court of Naples, and excited a
defire in the king to hear him perform; he was invited, by
order of his majesty, to that capital. Corelli, with some
reluctance, was at length prevailed on to accept the invita-
tion; but, lest he should not be well accompanied, he took
with him his own second violin and violoncello. At Naples
he found Alessandro Scarlatti, and several other masters, who
entreated him to play some of his concertos before the king;
this he for some time declined, on account of his whole
band not being with him, and there was no time, he said,
for a rehearsal. At length, however, he consented; and in
great fear performed the first of his concertos. His allom-
ment was very great to find that the Neapolitan band ex-
cluded his concertos almost as accurately at light, as his own
band, after repeated rehearsals, when they had almost got
them by heart. Si facias, (says he to Matteo, his second
violin) a Napoli!

"After this, being again admitted into his majesty's
preference, and desired to perform one of his sonatas, the
king found one of the adagios so long and dry, that being
tired, he quitted the room, to the great mortification of
Corelli. Afterwards, he was desired to lead in the perfor-
amance of a masque composed by Scarlatti, which was to be
executed before the king; this he undertook, but from
Scarlatti's little knowledge of the violin, the part was some-
what awkward and difficult: in one place it went up to F;
and when they came to that passage, Corelli failed, and was
unable to execute it; but he was acquitted beyond measure
by the king, the Neapolitan leader, and the other vi-
olinists, perform which that had baffled his skill. A song
succeeded this in C minor, which Corelli led off in C major;
riconminicatam, said Scarlatti, good-naturedly. Still Corelli
performed in the major key, till Scarlatti was obliged to call
out to him, and let him right. So mortified was poor Cor-
relli with this disgrace, and the general had figure he imag-
ined he had made at Naples, that he fled back to Rome in
silence.

"It was soon after this, that a hautbois player, whose
name Geminiani could not recoleét, acquired such a prelau-
se at Rome, that Corelli, disgusted, would never play again
in public. All these mortifications, joined to the success
of Valentini, whose concertos and performances, though
infinately inferior to those of Corelli, were become fashion-
able, threw him into such a state of melancholy and cha-
bras, as was thought, said Geminiani, to have hastened his
death."

This account of Corelli's journey to Naples is not a
mere personal anecdote, as it throws a light upon the com-
parative state of music at Naples and at Rome, in Corelli's
time, and exhibits a curious contrast between the fiery genius
of the Neapolitans, and the meek, timid, and gen-

eral character of Corelli, so analogous to the fyle of his
music.

In 1712, his concertos were published in a beautiful
edition, engraved at Amsterdam, by Etienne Roger and
Michael Charles le Cerne, and dedicated to John Wil-
liam, prince palatine of the Rhine; but, alas! the au-
thor surived the publication of this admirable work but
six weeks; the dedication bearing date at Rome, the 3d
day of December 1712, and he died on the 18th of January
1713.

He was buried in the church of the Rotunda or Pantheon,
in the first chapel on the left hand of the entrance of that
beautiful temple, where a monument, with a marble bust
on it, was erected to his memory, near that of the great pain-
ter Raphael, by Philip William, count palatine of the Rhine,
der the care of Cardinal Ottoboni; on which is the fol-
lowing inscription:

D. O. M.
Archangeliio Corlelio a Funignano
Philippi Wilhelmi Comitis Palatini Rheni
S. R. I. Principis ac Electoris
Beneficentia
Marchionis de Laderburg
quod exiitius Amini Dotibus
et Incomparabili in Musicae modulis peritia
fummis Pontificibus apprime caruis
Italiz atque exters Nationibus Admirationi fuerit
indulgentis Clemente XI P. O. M.
et Gallarium Protecteur
Lyridi Celeberrimo
inter Familias funs jam du un adicito
 ejus Nomen Immortalitati commendantus
M. P. C.
Vixit Annos LI X. Mens. X. Dies XX.
Obit. IV. Id. Januarii Anno Sal. MDCCXIII.

During many years after his decease, there was a kind of
commemoration of this admirable musician in the Pantheon,
by a solemn service, consisting of pieces selected from his own
works, and performed by a numerous band, on the anniver-
sary of his funeral. A solemnity which continued as long
as his immediate scholars survived, to conduct and perform
in it. The late Mr. Wifman, who arrived at Rome before
the discontinuance of this laudable custom, assured us that
his works used to be performed, on this occasion, in a flow-
ning, and distinct manner, just as they were written, without
changing the passages in the way of embellishment. And
this, it is probable, was the way in which Corelli himself
used to play them.

Of the private life and moral character of this composer,
little new information can now be acquired or expe-
cited; but if we may judge of his equanimity and natural dispo-
ition by the mildness, facetiousness, and even tenor of his musical ideas,
his temper must have endeared him to all his acquaintance, as
much as his talents.

Indeed, the account that is given of his dying worth
cooa.o. of a valuable collection of pictures, and
bequeathing them all to his patron Cardinal Ottoboni, does
more honour to his parsimony and gratitude, than judgment;
a musician leaving money to a cardinal, while he had a rela-
tion or neccessitous friend in the world, seems to favour more
of vanity, than true generosity. And the cardinal, himself,
manifested his opinion of this bequest, by keeping only the
pictures, and distributing the rest of Corelli's effects among
his poor relations, to whom they naturally appertained.

To attempt to give a character here of Corelli's composi-
tions, which have been so long heard and universally admis-
ted, may to many of our readers appear wholly useless; yet
as they are thrown aside as antiquated lumber by some, and
regarded as models of perfection by others, our wish is to rank
each musician in his true place, with equity and faireness,
inclines us to make a few reflections on the genius and works of
this master, before we quit the subject.

As Corelli originally titled the second and fourth opera of
his sonatas, "Balletti da Camera," from the dancing and fa-
miliar movements contained in them; the first and third, from
their gravity of style and movement, may be called
"Sonate da Chiesa." The name distinction may be made
with propriety in his concertos, and even sonatas; the first

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eight of the former, and six of the latter, being much more solemn and ecclesiastical than the rest.

With regard to the intrinsic worth of his four books of sonatas at present, notwithstanding the exquisite pleasure they may have afforded ourselves and others, during youth, it is very much diminished by the general improvement of melody, knowledge of the bow, and boldness of modulation, which have freed invention from former fancies, and generated new ideas and effects. Indeed, during the time of Corelli, and long after, every one who knew the mechanical laws of harmony, however ignorant of the violin, let about composing sonatas, solos, and concertos, for it; but the great masters of that instrument, whose genius and invention have kept pace with their hand, have now nearly crushed all such impudent and impudent attempts.

Corelli’s sonatas, as a classical book for forming the hand of a young practitioner on the violin, has ever been regarded as a most useful and valuable work, by the greatest masters of that instrument. We were told by Mr. Wiseman at Rome, that when he first arrived in that city, about twenty years after Corelli’s decease, he was informed by several persons who had been acquainted with him, that his “Opus Quinta,” on which all good schools for the violin have been since founded, cost him three years to refine and correct. Tartini formed all the scholars on these solos; and Signor Giardini has told us, that of any two pupils of equal age and disposition, if the one was to begin his studies by Corelli, and the other by Geminiani, or any other eminent master whatever, he is sure that the first would become the best performer.

The concertos of Corelli seem to have withstood all the attacks of time and fashion with more firmness than any of his other works. The harmony is so pure, so rich, and so grateful; the parts are so clearly, judiciously, and ingeniously disposed; and the effect of the whole, from a large band, to a majestic, solemn, and sublime, that they preclude all criticism, and make us forget that there is any other music of the same kind existing.

Geminiani, according to our friend’s memorandums, whence an extract has already been given, affirms that Corelli rivalled himself much of the compositions of other masters, particularly of the sonatas in which he played at Rome; that he acquired much from Lulli, particularly the method of modulating in the legatura, and from Bononcini’s famous Camilla.” This was not very intelligible; nor does the charge appear well founded; as Lulli has made but little use of the legatura. With these maestros we are acquainted; but we find frequent imitations of the more natural passages of Scarlatti, particularly in the beautiful adagio of his eighth concerto, in which there is a great resemblance to a movement in a cantata which was set by Scarlatti in 1704, eight years prior to the publication of Corelli’s concertos.

There was little or no melody in instrumental music before Corelli’s time. And though he has much more grace and elegance in his cantilena than his predecessors, and flow and solemn movements abound in his works; yet true pathetic and impassioned melody and modulation seem wanting in them all. He appears to have been gifted with no uncommon powers of execution; yet, with all his purity and simplicity, he condescended to aim at difficulty, and manifestly did all he could in rapidity of finger and bow, in the long unmeaning allegros of his first, third, and sixth solos; where, for two whole pages together, common chords are broken into common divisions, all of one kind and colour, which nothing but the playing with great velocity and neatness could ever render tolerable. But like some characters and indecorous scenes in our best old plays, these have been long omitted in performance.

Indeed his knowledge of the power of the bow, in varying the expression of the same notes, was very much limited. Veracini and Tartini greatly extended these powers; and we well remember our pleasure and astonishment in hearing Giardini, in a solo that he performed at the oratorio, 1709,
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play an air at the end of it with variations, in which, by repeating each strain with different bowing, without changing a single note in the melody, he gave it all the effect and novelty of a new variation of the passages.

However, if we recollect that some of Corelli's works are now more than a hundred years old, we shall wonder at their grace and elegance which can only be accounted for on the principle of ease and simplicity. Purcell, who composed for ignorant and clumsy performers, was obliged to write down all the fashionable graces and embellishments of the times, on which account his music soon became obsolete and old-fashioned; whereas the plainsness and simplicity of Corelli have given longevity to his works, which can always be modernized by a judicious performer, with very few changes or embellishments. And, indeed, Corelli's productions continued longer in unfading favour in England than in his own country, or in any other part of Europe; and have hence only given way to the more fanciful compositions of the two Mantins, Zanelli, Camponi, Giardini, Bach, Abel, Schwindi, Baccherini, Stamitz, Haydn, Mozart, and Pleyel.

After the publication of Corelli's works, the violin seems to have increased in favour all over Europe.

Coren delini, in Geography, a town of Swiffzerland, in the canton of Solothurn, to 9m. N. of Solareum.

Corentin, a considerate river of South America, in Dutch Guiana.


This genus differs from bidens in having a ray, and from verbena in having the florets of the ray barren.

Sp. 1. Coreopsis fulva. Wild. 1. Jacq. Hort. Schen. 1705. tab. 373. "Leaves bipinnatit; pinnule linear-lanceolate, with ribs half their breadth." Root perennial; outer-leaves of the calyx numeros, reflexed. A native of Mexico. 2. Coreopsis verticillata. Linn. Sp. Pl. 1. Mart. 1. Wild. 2. Bot. Mag. 156. (Coreopsis verticillata; Gr. Virg. 151. Chrysanthemum; Flk. Mant. 48. tab. 544. fig. 4.) "Leaves decomposed-pinnate; segments filiform." Root biennial. Stem from a foot and half to three feet high, erect, fringed. Leaves fcfille, opposite, but often appearing to grow in whorls in consequence of being cut off at the base into linear segments, which are curved in various directions. Flowers terminal; florets of the disk brown; of the ray yellow; calyx short; outer leaves narrow, loofy, shorter than the others. A native of Virginia and Louisiana. 3. Coreopsis californica. Linn. 2. (Coreopsis fulva; Gr. Virg. 151. Chrysanthemum; Plk. Mant. 48. tab. 544. fig. 4.) "Leaves triplicate-pinnate; segments linear, candelabred on the upper surface." Nearly allied to the preceding, but constantly distinguished from it by its foliage and habit. Root perennial. Stem a foot and half high, erect, smooth, fringed. Leaves opposite, connate, fcfille, divided at the base into three pinnate segments. Flowers terminal; florets of the disk brown; on a somewhat prominent receptacle; of the ray yellow, acute, entire, or bifid; outer scales of the calyx narrow, loofy, obtuse. A native of Virginia. It may perhaps be doubted which of the last two is the verticillata of Linnaeus. 4. Coreopsis tinctoria. Wild. 3. Ehret. Brit. 1719. "Leaves pinnatit; pinnae linear, three-parted or undivided; disk the same colour with the ray." Root perennial. A native of Carolina. Wild登now supposes this species to be the verticillata of La Marek; but he cannot be right, if it have the disk and ray of the same colour; for La Marek, who described from a living plant, expressly says, that the disk of his verticillata is brown, and its ray yellow. It is on this circumstance alone, that the separate existance of tenuifolia seems to depend. 5. Coreopsis coronata. Linn. Sp. Pl. 2. Mart. 2. Wild. 4. (Coreopsis coronata; Plk. Mant. 48. tab. 544. fig. 4.) "Leaves pinnate, serrate, marked with lines; smooth." Root annual. The plant is altogether that of Bidens frondosa; but it has the flowers of Coreopsis, with a large ray of eight fringed, oval florets. A native of Virginia. 6. Coreopsis triestifolia. Wild. 5. Mich. am. 2. 139. "Leaves pinnate, lanceolate, serrate, smooth; scales of the outer calyx ciliate-serrate." A native of Upper Carolina, in moist ground. 7. Coreopsis virgata. Wild. 5. (Coreopsis virgata; Mich. am. 2. 140.) "Leaves pinnate, serrate, pube-vent; horns of the seed very long, divaricated." A native of North America in the country of Illinois. 8. Coreopsis aequiflora. Mart. 188. Jaff. 140. "Leaves pinnate; pinnule five, serrate-glaber; ray six-flowered; seed three-horned." Root spindly-flushed, fleshy, white. Stem a foot and half high, herbaceous, erect, quadrangular, grooved. Leaves quinate, lanceolate. Flowers entirely fuscous-coloured, few together, on terminal peduncles; florets of the ray six; eggl-shaped, quite entire; horns of the seed brittle and divided; calyx erect, many-leaved. A native of China. 9. Coreopsis nitida. Wild. 7. Mich. sper. 2. 140. "Lower leaves bipinnatifid; upper ones linear, three-parted; seeds naked." Calyxes generally simple, sometimes somewhat ciliated. A native of marshes in Carolina. 10. Coreopsis leucantha. Linn. Sp. Pl. 6. Mart. 3. Lam. 6. (Bidens leucantha; Wild.) "Leaves pinnate, serrate; florets of the ray of a different colour from those of the disk." Root annual. Stem three or four feet high, quadrangular, smoothish; the opposite sides channelled; branches opposite. Pinnule five, seldom three, eggl-shaped, undivided, smooth, equal, even; the three outer often confluent, almost decurrent by the outer side, quite entire at the tip; petalschannelled, connected on both sides by villous hairs. Flowers terminal, alternate, two or three, on long peduncles; inner scales of the calyx five; outer five, smaller, more distinctly separated; florets of the ray five; eggl-shaped, three-toothed, three-nerved underneath; disk small, convex, yellow. Seeds three-horned, hump'd backwards. Linn. A native of Virginia. La Marek thinks it not distinct from C. coronata. 11. Coreopsis auriculata. Lam. 7. (Coreopsis virgata; Linn. Sp. Pl. 6. Mart. 2. Lam.) Wild. 7. Bidens americana triumpha; Plk. Mant. 48. tab. 544. fig. 4.) "Leaves serrate, serrate, smooth; florets of the ray of a different colour." Root sweet-scented, whitish, fibrous. Stem about three feet high, quadrangular, smooth, sweet-scented. Leaves opposite; generally composed of three eggl-shaped, acute, smooth, toothed-leaves. Flowers terminal, solitary; florets of the ray yellow, resembling the common cow-wheat. Seeds three-horned; receptacle almost hemispherical. Plk. Mss. A native of the West Indies, and South America. Linnaeus, in his specific character, describes the ray as similar in colour to the disk, and if he had not quoted Plummer as his


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tioled, veined, decurrent; lower ones whorled; upper ones alternate. Root perennial. A native of North America, flowering in September and October. Professor Martyn conjectures that this is the alternifolia of Linnaeus, and that the alternifolia of Hortus Kewensis is a different plant. 30. C. radiata. Mill. Mart. 17. "Leaves linear-lanceolate, sharply serrated, opposite; ray of the flower large, entire." Root annual. Stems four feet high, creet. Leaves from three to four inches long, three quarters of an inch broad, acuminate, or short petioles. Flowers two from each of the upper joints of the stem, opposite; peduncles, long; flinders, bearing two or three pairs of small leaves or bracts, one-flowered; flowers of the ray five, oval, entire; of the disk numerous, dark-coloured. A native of South Carolina, flowering in August, raised by Miller from seeds lent by Dr. Dale.


Propagation and Culture. Most of the perennial species are hardly and may be readily increased by parting the roots. The second and fourteenth require a light loamy earth and sunny exposure. The geographical should be sown in a hot-bed and afterwards transplanted into a warm border.

Coreopsis, in Gardening, contains plants of the flowering herbaceous perennial kind; of which the species cultivated are the whole leaved coreopsis, or tick feed flower. (C. verticillata.) The three leaved coreopsis. (C. trilobata.) The alternate leaved coreopsis. (C. alternifolia.) The four leaved coreopsis. (C. lanceolata.)

Method of Cultivation. The mode of propagation in these plants is easily effected, either by crumbling or dividing the roots in autumn when the bracts decay, planting them where they are to remain, keeping them clean from weeds, and cutting down the bracts annually in autumn when they begin to decay. The third and fourth months may be rendered more favorable by the use of a hot-bed. All these plants are well calculated for the more large borders and chums, introducing them in the vacant spaces between shrubs, as they exhibit a plentiful bloom till late in the autumnal months.

Coreesium, in Ancient Geography, a lake or marsh in the island of Crete. Steph. Byz.

Coressus, one of the four towns of the island of Cossus, according to Strabo and Ptolemy. Coreesium, or Corecis, a name given by Xenophon, Diodorus Siculus, Sec. to a high mountain of Asi Minor in Ionia, about 40 stadia from the city of Ephesus. At the foot of this mountain was a town of the same name, called by Steph. Byz. Coremis, which he represents to be a town of Ephesus, because of its dependence upon it. He says that it derived its name from the following circumstance. Diana, having been delivered of Lenata, and having brought her band ashore of the people of the country to whom this place belonged? they replied "Kep, os!" Virgin, it is yours. In this fable is traced the etymology of the name.

Coreta, in Botany, Brown. See Corchorus silique-fus.

Coretta, in Ichthyology, the name of a large East Indian fish of the tunny kind, and figulated to be no other than the common tunny, or Scornax Thunnus. It grows to fix or even feet long. Its eyes are large, and its irises yellow; its tail is broad and forked, and in colour of a yellowish green; its belly-fins are yellowish, and its belly of a fine bright glossy blue, with a silvery cast. It is generally caught with hooks, and is a very fine tailed fish. Ray.

Coretum, in Ancient Geography, a gulf of Palm- Mazots, according to Pliny; who says that a mountain of rocks separated this gulf from the lake of Buge, into which the river Hysanas discharged itself.

Coreva, or Corelia, a place of Africa propria, on the route from Turbarua to Tacape, between Valla and Mufi, according to Antonine.

Coreur, a town of Syria on this side of the Ganges, according to Ptolemy. It is thought to be the same with Coreera.

Corfe Castle, in Geography, is an ancient market-town, situated near the centre of the Isle of Purbeck in Dorsetshire, England; at the foot of a range of hills, on a rising ground, declining to the sea. Its origin must undoubtedly be attributed to the castle, which existed previous to the year 982: though the town itself does not appear to have been of any importance till after the conquest, it being wholly unnoticed in Domesday book. The manor and castle seem always to have defended together. Though this is an ancient borough by prescription, it was not incorporated till 18th Eliz., when Earl Christopher Hatton obtained a charter, inwelling the inhabitants with liberties similar to those of the Cinque-ports, with various other privileges; these were confirmed by James I. and Charles I. The government of the town is vested in a mayor, and eight barons who have served the office of mayor. The earliest return to parliament was in 14 Eliz.; the right of election is possessed by all persons within the borough who are feized in fee, in possession, or reversion, of any freehold, in tenants for years, determinable on any life or lives, paying foot and lot. The town consists chiefly of two streets of stone buildings. The church, a large ancient fabric, comprises a nave, chancel, two aisles, and a large embattled tower: twelve arched arches support the roof, and four pillars, in the Saxon style, but all different, are connected with the porch. The number of houses in the late return was 152; and of inhabitants 741; many of whom find employment in the adjoining clay-works and flint quarries; and a few in knitting stockings. A weekly market is held on Thursdays. This town is 116 miles S.W. from London. The district which includes Corfe castle, and is about ten miles in length and eight in breadth, contains twelve or thirteen Sunday schools, distributed through the different parishes; each being governed by a committee of the principal inhabitants, subject to the inspection of a general committee who meet at Corfe castle as occasion may require. The average number of children who attend these schools is about 450. Dorsetshire was one of the first counties in which Sunday schools were established. Some excellent regulations, relative to the general management of these institutions, may be seen in Hutchison's Dorset, vol. i. p. 328, 2d edit.

The castle at Corfe "stands a little north of the town, opposite to the church, on a very steep rocky hill, mingled with hard, roughly chalk-stone, in the opening of those ranges of hills that incline to the east part of the site. Its situation between the ends of these hills deprives it of much of its natural and artificial strength, being too much commanded by them, that they overlook the tops of the highest towers; yet its flintwork is so strong, the ascent of the hill on all sides but the fourth to steep, and the walls so many and thick, that it must have been one of the most impregnable fortresses in the kingdom before the invention of artillery. It was of great importance in respect to its command over the whole site; whence our Saxons flours pleasantly did it Corfe gate, being the pafs and avenue into the belt part of the site." (Hutchinson's Dorset, i. 280.) The castle is separated from the
the town by a strong bridge, of four very high, narrow, semi-circular arches, crossing a deep moat, now dry. The bridge leads to the gate of the first tier, which remains nearly entire, probably from the thickness of the walls, which, from the outward to the inner bridge, is in some parts still nine yards. On the higher part of the hill, at some distance from the centre of the fortress, there is the keep or citadel, which still retains nearly its original height, and commands a very extensive prospect to the north and west.

The precise period when this castle was built is uncertain; but from concurrent circumstances its erection is ascribed to King Edgar. That it did not exist previously to the year 887, when the munition at Shaftesbury was established, is certain, from an inquisition taken 54 Hen. III.; whereas the jurors returned, "that the abbeys and mansions at Shafton (Shaftesbury) had, without molestation, before the foundation of the castle at Corfe, all works within their manor of Kingston, in the isle of Purbeck."

Between two and three miles eastward of Corfe, is Nine Barrow Down, an eminence to named from nine large barrows situated on it in a line, supposed to be of British construction. The whole number of barrows on this downs are sixteen of various dimensions; most of them circular, and very regularly shaped. A shallow trench surrounds eight or ten; and near them is a hollow or cavity. The highest part of the downs rises 642 feet above low water mark.

At a small distance, north west of Corfe, is Grange or Grece Groane, the seat of John Bond, esq.; it anciently was part of the possessions of the abbey of Blandon, and the occasional residence of the Abbot. Hutchins's History of Dorsetshire.

CORFINIUM (S. Pelino), in Ancient Geography, a town of Italy, the capital of the Peligni, situated at a small distance from the Aternum, on a delightful plain surrounded by mountains. In the time of the Social war, A. D. 662, the allies fortified it, and made it a place of arms. During the civil wars, Caesar obliged Domition to retire hither, befleged him there, and took the place.

CORFU, in Geography, the ancient CORCIRA (which fre), an island of the Mediterranean, at the mouth of the Adriatic, near the coast of Albania, about 15 leagues long and 8 wide. In ancient times the inhabitants of this island formed a powerful republic; in succeeding times it belonged to the king of Naples; and it was afterwards sold for 30,000 ducats to the Venetians, who maintained a fleet of galleys in the port, and a strong garrison to defend this and the neighbouring islands. It was seized by the French in 1797; and by an article in the treaty of Campo Formio, in 1797, the French republic was allowed by his majesty, the emperor, king of Hungary and Bohemia, to polleds, in full sovereignty, the cit-devant Venetian fylaps of the Levant, viz. Corfu, Zante, Cephalonia, St. Muree, Corigo, and other islands dependent on them, together with all the cit-devant establishments in Albania, which are situated lower down than the gulf of Dodino. In 1799 this island was taken by the Russians, and, together with Cephalonia and Zante, &c. constitute an independent republic under the protection of Russia.

This island is said to contain about 50,000 persons, and is divided into four bailiwicks or governments. The religion of Corin is partly that of the Latin and partly that of the Greek church. The latter has for its chief a proto-papa, or head-priest, elected in an assembly of the clergy and nobility; he is immediately dependent on the patriarch of Constantinople, and pollethes all the episcopal powers. His office lasts five years, and he then returns to the chief of ordinary paps, with the privilege of wearing a crimson girdle. His revenue is confined to the prebendes of his office, the amount of which he continues to increase, as an indemnity for the expense he incurred in procuring his nomination. To the cathedral there are canons attached, as to that of the Latina church; but they have no fixed pretend. The only advantage accruing from their canonicate is that of being at the head of the clergy, together with the honour of wearing a violet girdle, and a small tassal of the same colour to their hats. The number of churches in Corfu is very considerable. Each officiating priest is annually elected by the assembled parishioners; but he has no fixed salary. Most of the churches, especially those in the country, have been built by private persons, who, as proprietors, nominate the papa. The richest of these churches is that in which are deposited the relics of St. Spiridion, to whom the Greeks pay a peculiar devotion; and the festival of this saint is celebrated with the greatest pomp. The night between Holy Thursday and Good Friday is remarkable for the number of processions which perambulate the city.

In the isle of Corfu are several convents of men and women, which tend very much to oppress the inhabitants. The ignorance of the Greek clergy, especially in the rural parts, is so great as to be proverbial; the most learned among them being hardly capable of writing and reading their own language.

The air of this island is healthy, the land fertile, and the fruit excellent. Oranges, citrons, the most delicious grapes, honey, wax, and oil are very abundant. Some places are mountainous and barren, and good water is scarce. Salt forms a great part of its riches.

CORFU, the capital of the fore-mentioned island, the seat of a bailiff, a provost, a captain, &c. and the see of an archbishop. It is fortified, and defended by two fortresses; the town has a good harbour and a considerable trade. N. lat. 36° 43'. E. long. 20° 2'.

CORGAL, a country of India, near the coast of Malabar, bounded on the N. and E. by the Myfore country, on the S. by the country of the Nayrs, and on the W. by the sea.

CORGATHA, in Ancient Geography, a town of India, according to Ptolemy.

CORGOLIN, in Geography, a town of France, in the department of the Côte d'Or, and district of Beaune; 5 miles N. of Beaune.

COR, anciently Coria, a town of Italy, in the Campagna di Roma; 10 miles S. of Palestrino.

CORIA, or CORICA, in Ancient Geography, a town of the isle of Albion, in the country of the Damni, according to Ptolemy. The conjectures about the situation of this place are various and doubtful; but, upon the whole, that of Mr. Baxter seems to be the most probable, who places it at Kirkintilloch, a place of great antiquity, upon the wall, about 6 miles from Glasgow.—Alto, a town of Albion, belonging to the Otadesi, and supposed to be Corbridge in Northumberland by Camden and Baxter; but Hulsey imagines it to have been situated much farther north, probably at Jedburgh, and supposes it to have belonged to the Gadeni.—Allo, a place of Greece, in the Peloponnesus; near the town of Helice, according to Ælian.—Allo, a town of Italy, near Rome. See Cori.

CORIA, in Geography, a town of Spain, in the province of Estremadura, the see of a bishop. It contains two churches, two convents, and two hospitales; near it are medicinal springs; 90 miles E. of Toledo, and 110 E.S.E. of Madrid. N. lat. 39° 36'. Long. 16° 38' E. of Peak of Tenerife.—Allo,
COR

Alfo, a town of Spain, in the county of Seville, on the Guadalquivir: 7 miles from Seville.

CORIACO, a town of S. America, in the province of Cumana, on a gulf to which it gives name; 40 miles E. of New Cordova. It contains about 6,500 persons.

CORIALLUM, in Ancient Geography, a place of Gaul, in the Lyonnensis secunda; near the cape de la Hogue, according to d’Anville.

CORIANDER, in Agriculture, the name of a plant which is cultivated in the field by the farmer in some districts, though not to any very great extent. In both Effex and Kent it is, however, occasionally met with as a field crop.

In its culture it is advised, that the seed should be sown in the autumnal season, on rich, friable land, which has been well prepared by tillage; and that when the plants have risen above the surface of the ground, they should be hoed out to the distance of about four inches every way, clearing them well from all sorts of weeds. It is supposed that by this management they will become strong, and produce a greater quantity of good seed.

The advantages of cultivating this sort of crop are thus stated in the fourth volume of the Letters and Papers of the Bath Society.

Sowed ten perches of land with coriander seed, the foil a good sandy loam.

Expences.

<table>
<thead>
<tr>
<th>Description</th>
<th>£.</th>
<th>s.</th>
<th>d.</th>
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<tbody>
<tr>
<td>Three ploughings</td>
<td>-</td>
<td>-</td>
<td>0 1 6</td>
</tr>
<tr>
<td>Sowing and harrowing</td>
<td>-</td>
<td>-</td>
<td>0 0 1</td>
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<tr>
<td>Four pounds of seed, at 3 d.</td>
<td>-</td>
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<td>0 0 3</td>
</tr>
<tr>
<td>Ripling</td>
<td>-</td>
<td>-</td>
<td>0 1 0</td>
</tr>
<tr>
<td>Rent</td>
<td>-</td>
<td>-</td>
<td>0 2 6</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
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<td><strong>0 5 10</strong></td>
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Production.

<table>
<thead>
<tr>
<th>Description</th>
<th>£.</th>
<th>s.</th>
<th>d.</th>
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<tbody>
<tr>
<td>87 pounds of coriander seed, at 3 d.</td>
<td>1</td>
<td>1 9</td>
<td></td>
</tr>
<tr>
<td>Deduct expences</td>
<td>0 5 10</td>
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<tr>
<td><strong>Profit</strong></td>
<td><strong>0 15 11</strong></td>
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or 15 l. 18s. 4d. per acre.

The author of the paper observes, that he has since made several larger experiments in this article, but that none has proved so good a crop as the preceding, yet all of them such as to afford a good profit. There is a ready sale for the seed with the druggists, druggists, and confectioners. The former purchase very large quantities: the price varies from 15s. to 42s.

According to Mr. Vancouver, in his Account of Effex Husbandry, the mode of cultivation is thus performed.

"The culture of coriander, which has been much attended to in the neighbourhood of Tolhurst Darcey, is, he says, thus managed: old lay-ground is ploughed in the beginning of March, and after the surface is completely pulverized, the seed is sown fourteen pounds to the acre; three hoeing and letting out the plants four inches square will cost one guinea per acre. Average produce, 10 cwt. per acre, 12s. per cwt. This is considered to be a very good preparation, after once ploughing, for wheat; and as the land is generally ploughed in two yard ridges, or fitches of eight furrows wide, a row of beans is generally planted with the coriander, on each side of the open furrows between the fitches, and are usually harvested at the same time.

"It is frequently the case in this district to cultivate a triple sort of crop, consisting of coriander, caraway, and teasel.

"When (says the above writer) caraway is sown with the coriander, from the care and attention necessarily bestowed on differenting the plants, the hoeing seldom costs less than one guinea and a half per acre; but the caraway is not regularly set out for a crop till after the coriander is harvested, at which time a very expensive hoing becomes indispensably necessary.

"Teasel is sometimes cultivated in the same field, the feed being sown with the coriander and caraway; but as neither the caraway nor teasel come completely and regularly the second year, both crops are usually allowed to stand for the third summer. This is esteemed good management for old coarse pasture grounds, which, after three ploughings, are commonly sown with wheat, and then cleans chalked."

The following directions are given for this culture, by Mr. Sewell of Maplestead: "About the beginning of March, plough some old pasture land; if it has been ploughed for a century, the better; and the soil should be a very strong clayey loam. Mix 12 lbs. of caraway, 10 lbs. of coriander, and 12 lbs. of teasel seeds together, which is sufficient for one acre; sow directly after the plough and dries (he supposes harrow) the land well. When the plants appear of sufficient strength to bear the hoe (which will not be until about ten weeks after sowing), it must not be omitted, and in the course of the summer it will require three hoeings, and one at Michaelmas; each will be about 8s. per acre. The coriander is annual, and is fit to cut about the beginning of July; it should be left in the field after cutting, and throned on a cloth, in the same manner as rape feed.

"About April following, your teasel and caraway will want a good hoing, done deep and well, and another hoing about the beginning of June; these two hoings are to be done at 7s. per acre each. The caraway will be cut to the beginning of July, and must be throned in the same manner as coriander. The teasel will not be ready till the middle of September, when those heads which are beginning to turn brown are cut off the stem, with a flax a foot long, and 25 of them are tied in a bunch, 24 of the bunches are fixed on a small flax, and called a row, 24 of which make a load in bulk, equal to a ton of hay from the meadow. The work of cutting and bunching the teasel can only be done by those who have been well acquainted with and learned the mode; it must be looked over, and the heads cut at several times, as they ripen. The teasel and caraway are perennial, and some of the plants do not perfect their seeds till the third or fourth year, though in general you have a crop the second year, and the seeds that are scattered from the crop the second year often come to perfection the fourth year; he has known instances of this being continued for seven years. The usual way is to plough directly after the crop is gathered the third year, and for which, of which commonly a good crop is obtained, the land being in fine order, from the turf being rotten, and the repeated hoings. See Tassel.

"The first appearance of teasel, after it is sown, is much like a lettuce, coriander like a parsnip, and caraway like carrots. The produce of caraway has often been, on the very rich old lays in the hundreds or low lands of the county, 20 cwt. per acre. There is always a demand for it in the London market, sometimes to low 45s. per cwt., and it has been up to 50s. per cwt.; mostly on an average at 21s.
Coriander is also very productive on good land, often producing 24 cwt. per acre, sometimes not more than 6 or 7 cwt., the price being sometimes 36s. per Cwt., often so low as 10s., average in general about 12s., London market. Teasels are used only amongst the manufacturers of ordinary cloth and baizes, to raise the wool on them that covers the thread. As we have a large business of that kind carried on in this part of the country, we have a regular demand for teasel; the average price 12s. per load, the produce sometimes a load per acre, often not more than one-fourth of a load. The land can only be filled with plants, and the more one kind predominates, the less malt reasonably be expected of the crop that succeeds. It is mowly fown on land so strong, as to require being a little exhausted to bring it fit for bearing corn. In drill of the land fown with caraway and coriander the teasel is omitted, as being a more troublesome and uncertain crop, and generally the product of car-raway is much greater without than with teasel.

In many parts of this district there are gardening-farmers who travel about and contract for breaking up old grafs land, in order to sow caraway. The farmer ploughs to a great depth, and does whatever horse-work is wanted, finding the land also at a rent of 15s. per acre on some farms, and the produce is divided. It is reckoned a more profitable way of breaking up grafs than for common crops; but, much depending on a variable price, is reckoned hazardous; though the caraway men have intelligence enough among themselves to aim at not overflockelting the market.

It is observed, that the coriander is always the first crop, the caraway being fown with it as clover is with barley to succeed it; and it is left from three to six years, according to the success; great hoeing is bestowed on it to keep the land clean: when it returns to the farmer, if there be noch he falls, if not, he fows wheat. With some farmers their half receipt from 50 acres has varied from 150l. to 200l. a year.

Coriander, in Botany. See Coriandrum.


Eff. Ch. Petals infulced, emarginate. General involucel one-leaved or none; partial, going half way round, or none. Fruit sphericel, or serotiform.

Sp. 1. C. foetuosa. Linn. Sp. Pl. 1. Mart. 1. Lam. 1. Willd. 1. Gært. tab. 22. fig. 2. Linn. Illuat. Pl. 105. fig. 1. Woodv. Med. Bot. tab. 181. Eng. Bot. Pl. 67. Bauh. Pin. "Fruit globular," Root annual, strong-fencel. Stam. about a foot and half high, erect, smooth, slightly fristed, cylindrical, generally branched and divericated. Leaves compound; lower ones pinnated; leaflets roundish-ovate, lobed, and toothed; upper ones twice-ternate; segments linear. General and partial umbel many-rcved. General involuce of one linear leaf; partial involuce from three to five-leaved, going half way round; leaves lanceolate. Flowers white, tinged with red; proper calyx very conspicuous; outer petals of the outer flowers large, forming a kind of ray round the umbel. Fruit oblongely ribbed, aromatic. A native of the southern parts of Europe and of China; naturalized in Suffolk about Ipswich, and in some parts of Essex. Every part of the plant, when fresh, has a very offensive smell; but the dried seeds have a tolerably grateful smell, with a moderately warm and slightly pungent taste. They are diaphoretic and carminative, and are commonly sold by the confectioners encrusted with sugar. When taken in large quantities they are said to be delerious, but Dr. Withering affirms that he has known six glasses of tea taken down at once, without any remarkable effect. They give out their virtue totally to refined spirits, but only partially to water. The Edinburgh college use them in the bitter infusion and the preparations of ferns, to cover the disagreeable taste, and prevent the gripping tendency of those medicines. 2. C. telescicultural. Linn. Sp. Pl. 2. Mart. 2. Lam. 2. Ill. Pl. 196. fig. 2. Willd. 2. (C. minus telescicultural; Bauh. Pin. 156. Pluk. aln. 120. tab. 169. fig. 2.) C. fylvestrae fuscitidisumum; Bauh. Pin. 158. "Fruit diodeous." Root annual. Stem scarcely a foot and half high, angular, branched. Leaves once or twice pinnated; leaflets deeply cut into narrow acute segments. Umbel small, often simple. Partial involucel none, outer petals not forming a ray. Seeds separating below, almost cohering above, a little wrinkled, but not inflated. A native of the south of Europe.

Propagation and Culture.—Both species are raised from seeds sown in the autumn, in an open situation, on a bed of good fresh earth. When the plants are come up, nothing farther is necessary but to hoe them to about four inches distance every way, and to keep them clear from weeds. The first species is cultivated in Essex, mingled with carum carvi, or caraway; both foiey for the sake of the seeds. See Carum Carvi. To prevent the large and bulk part of the seed being lost, women and children are employed to cut every plant separately, and to put it immediately into a cloth, in which it is carried to some convenient part of the field, and there thrust upon a fail-cloth. The produce of an acre is from ten to fourteen hundred weight. See Coriander, in Agriculture.


Gen. Ch. Flowers dioecous, sometimes monoecious or polygamous. Male. Cal. Perianth very short, five-leafed; leaves somewhat egg-shaped, concave. Cor. Petals (Gland. Juss.) five, very small, placed on a disk on the outside of the flaments. Stam. Filaments ten, very short; anthers erec; oblong, with two cells separate at the base. Female Cal. like the male. Cor. Petals, as in the males, converging. Stam. as in the males, but abortive. Pyy. Germs five, compressed, united; stylos long, bristle-shaped; stigma filip. Peric. none. Seeds five, kidney-shaped, covered by the succulent petals which take the appearance of a berry. Linn. (Peric. Capsules five, connivent, small, one-seeded, not delicient, covered on the side by the enlarged and thickened glands, making the fruit look like half a berry.) Juss.

Eff. Ch. Calyx five-leaved; corollae five-petalied; anthers ten, almost filide. Styles five. Seeds five, covered by the succulent petals.

Lam. III. Pl. 822. (Rhus myrtifolia monspeliaca; 
Buch. Pin. p. 414.) "Leaves almost sessile, ovate-ob-
long, flowers in racemes." A shrub four or five feet high. 
Stems smooth, cincereous; branches opposite, lute, flexible; 
young ones quadrangular. Leaves opposite, entire, smooth, 
acute, green on both sides, nerved, smaller on the flower-
ing branches. *Racemes* simple, terminating the young la-
ter branches; bracteas foliarly, small, awl-shaped; pedun-
cles twice the length of the bracteas; calyx and corolla 
pale green; flowers sometimes monoecious, and sometimes 
hermaphrodite. A native of the south of France, and of 
*"Leaves cordate egg-shaped, sessile." A tree from twenty 
to twenty-five feet high. Trunk the thickness of a man, 
branched from the bottom. Leaves an inch and half long, 
an inch broad. Leaves opposite, nerved on the young 
branches, almost embracing the stem. Flowers as in the 
preceding species. A native of Chili. 3. C. microphylla. 
Poir. 3. *"Leaves very small, egg-shaped, obtuse, nearly 
seisile; flowers spikes, lateral." A shrub. Stems quadrangu-
lar; branches numerous, crowded, filiform, flexible, 
short. Leaves four or five lines long, three broad, opposite, 
firm, entire, slightly heart-shaped, green above, paler un-
derneath, nerved. Flowers on small filiform peduncles, 
with foliarly acute bracteas. A native of Peru. 4. C. far-
cordate egg-shaped, on short pedicles; stem procumbent, 
diffuse. A native of New Zealand.*

CORDIOL. See Arto Leon.

CORDBRASSUS, in Ancient Geography, an episcopal 
town of Aisa, in Pamphylia.

CORICANI. See Coritani.

CORICÆ inflata, small islands, between the island of Crete 
and the Peloponnesus. Pliny.

CORICEON promontorium, a promontory S. of the 
peninsula of Ionia, which advances towards the isle of Chios, 
in which is found Erythre.

CORICEUM, in Antiquity, the undressing-room belong-
ing to the Gymnasium.

CORIDERVA, in Geography, a rock situated about 2½ 
miles S.W. from Ila, one of the western islands of Scot-
land.

CORIDIS FOLIO, in Botany; Herm. See Line-

CORIDOR, is used, in Architecture, for a gallery, or 
long wall, around a building leading to several chambers 
at a distance from each other, sometimes wholly inclosed, 
and sometimes open on one side.

CORIDOR, or Corridor, in Fortification, the same as the 
covered-way, which fec.

CORIDORGIS, in Ancient Geography, a town of Ger-
many, situated on the Danube, between Medoitanum and 
Prumbellus. Ptolemy.

CORIENTES, in Geography, a cape of Mexico, or New 
Spain, on the N. Pacific ocean. N. lat. 25° 50'. W. long. 105° 
30'.-Allo, a cape of South America, on the coast of Peru, 
in the Pacific Ocean. N. lat. 4° 50'.-Allo, a cape of Af-
ear, on the eastern coast of the Indian Sea. S. lat. 24° 
15'. E. long. 33° 31'.-Allo, the name of the fourth-west-
ernmost point of the island of Cuba. N. lat. 21° 58'. W. 
long. 84° 30'.

CORIENTES, Los. See Corrientes.

CORILLA, in Biography, the Arcadian name given to 
the celebrated Improvisatrice, Maria Maddalena Morelli 
Fernandez, of Pilion; honoured at Rome with the laurel 
crown, 16 Feb. 1776, in the same manner as Petrarcha, 
Tasso, and Perfetto, had been before. An account of 
this translation, beautifully printed at Parma, by Bodoni, 
in 1779, contains her diploma and all the discourses, poems, 
sonnets, &c. written on the occasion, with the examination 
which she underwent, concerning her knowledge of the 
most important subjects upon which she was required to 
improvet on, or treat extempore, in verse publicly at the 
Campidaglio in Rome. The Italian title of this narra-
tive is, "Atti della solenne coroneazione fatta in Campido-
glio della insignepoetisa D-na. Maria Maddalena Morelli 
Fernandez Pilione. Tragali Arcadi Corilla Olimpie." Twelve 
members of the Arcadian academy were selected out of 50, 
publidy to examine this new edition of a Tenth Muse, 
which has been so often dedicated to ladies of poetical and 
literary talents. Three several days were allotted for this 
pubic exhibition of poetical powers on the following sub-
jects: sacred history, revealed religion, moral philosophy, 
natural history, metaphysics, epic poetry, legislation, elo-
quence, mythology, fine arts, and pastoral poetry.

In the list of examiners there appear a prince, an arch-
bishop, three monsignors, the pope's physician, abaci, avo-
cati, all of high rank in literate and criticism. These, 
severally, gave her subjects, which, besides a reading 
at verification in all the matters of Italian poetry, requir-
ed science, reading, and knowledge of every kind. In all 
these severe trials, she acquitted herself to the satis-
faction and astonishment of all the principal performances, 
clergy, literati, and foreigners then resident at Rome; among 
the latter was our foreigner's brother, the duke of Gloucester.

Near 50 sonnets by different poets, with odes, canzoni, 
terze rime, ottave, canzonette, &c. produced on the sub-
ject of this event, are inserted at the end of this narrative and 
description of the order and ceremonies of this splendid, 
honourable, and enthusiastic homage, paid to poetry, clas-
tical tale, talents, literature, and the fine arts.

This renowned lady merits no notice as a musician, as 
well as poet; as she sung her own verses to simple 
tunes with a sweet voice, and in good taste. She likewise 
played on the violin; but at Florence, where we saw and 
heard her, in 1779, she was accompanied on the violin by 
the celebrated and worthy pupil of Tartini, Nardini. At 
this time she was not more than 35; and had a pleasing, 
dignified, and intelligent countenance. See in the music 
pl. No. the two airs to which she sung at Florence, ex-
tempore verses on subjects given.

CORIM. See Hast-militaris.

CORINÆUM, in Ancient Geography, a promontory of 
Minor in Ionia; part of Mount Munar.

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

CORINDUM, in Botany. Tourne. See Carundii-

CORINE, in Zoology, the Antelope Corine of Gmel-
in, has very slender, short, smooth, ilarepilous horns, bent 
slightly into the form of a lyre; the upper parts of the body 
are yellowish-tawny, the under parts white, with a dark 
stripe along the sides, and two lines on each side of the face, 
the upper one white and the other black. This animal, 
which inhabits Senegal, is less than a roe; the neck, body, 
and flanks are of a tawny-yellow colour, the insides of the 
thighs and belly are white, and a dark line, along the sides, 
divides the two colours; the knees are tufted with hair; 

35 B 2
the ears are large; the horns are about six inches long, almost upright, bending a little outwards in the middle, and somewhat approaching at the tips, the lower parts being surounded with circular wrinkles. This species resembles the heave in colour, face, softness, and mufky odour; but differ very much from it in the figure of the horns; though Gmelin, after Pallas, suppose that it is the female of that species.

CORINEA, in Ancient Geography, a country of Asia, in Armenia Major. Ptolemy places it between the sources of the Tigris and Euphrates, and to the south of Thespis.

CORINEUM, a town situated on the southern coast of the isle of Cyprus, between Citium and Salamis. It was episcopal, and called by Hercules, in his Notitia, Corinth.

CORINUM, a town of Albani, belonging to the Dobunii, and allowed to be Greccefer in Gloucestershire—also, an ancient town of Illyria on the Adriatic gulf; supposed to be the present Cori.

CORINTH, Corinthus, a city of Greece in the Peloponnesus, upon a gulf of the same name. This city was the capital of a small state, situated on the isthmus of Corinth, having the bay of that name, now called the Gulf of Lepanto, and the isthmus or neck of land, which joins Peloponnesus to the continent, on the north; Scyuan, on the west; the gulf of Saron, on the east; and the kingdom of Argos, on the south. Its utmost extent from east to west was about half a degree, and from north to south, about half that space. It had no rivers of any note; but abounded with mountains, the chief of which was called Acrabornthium, at the foot of which the city of Corinth was built, and on the gulf stood the citadel. It was also famed for the fountain Pyrene, furred to the muses; though others place this fountain on the hill Helicon, and most others again, on that of Parnassus.

Corinth is said to have been founded by Sisyphus, the son of Aeusus, and grandfather of Ulysses, about the year of the world 2560, as some say; or according to others 2700; B.C. 1307, and about six years before DSenioron's flood, B.C. 1530. The ancient name of this city is said to have been Epiura, which it took from a nymph of that name, reported to have been the daughter of Oceanus and Tethys; or, according to others, of Meryss, the wife of Epimetheus, the son of Iapetus, and brother of Prometheus. At this time it was but an inconsiderable town, though it rose afterwards to be the metropolis of the kingdom, and one of the noblest and most opulent cities in Greece.

Corinth, the new name of this city, has been variously derived; some have deduced it from the Greek εομενος, fatis or abundance, implying the opulence of the place; but the ancient inhabitants trace the origin of the appellation to Corinthus, the son, as some have said, of Jupiter, or, according to others, of Marthon, and brother of Sicyon. However, most authors aterne the name, as well as the building, or rebuilding of it, to Corinthus, the son of Pelops. Corinth was also called Helipolus, or the city of the Sun, probably, as Gronovius conjectures, from the ruggedness and barrenness of its situation and territory, for such, as Strabo tells us, it really was.

Corinth, besides the citadel already mentioned, had two port-towns, viz. Lecheum situate on the bay of Corinth, and Cenehrea on that of Samos; and connected with the city by a double wall of about 12 stadia or half a league in length, different from the city by 70 stadia or about 3 leagues. There were the only two havens; and, indeed, the only two cities of any note, next to Corinth, that belonged to this territory. These were so well situate for naval commerce, and so near the metropolis, that they made ample compensation for the barrenness of the soil. These two naval roads which opened a way into the Ionian and Egean seas, might easily have gained for them a superiority, if not a command, over all Greece, if this advantageous situation had not inclined them more to commerce than war. For their citadel being almost impregnable by nature, and commanding both seas, they could easily cut off all communication between one half of Greece and the other; so that it was not without reason called one of the letters of Greece. But being led by their genius and disposition to improve their advantages more for navigation and commerce than for military exploits, they became in process of time so exceedingly opulent, that the little influence they had over the other states was owing rather to their wealth than their valour. By the gradual increase of their opulence, partly from commerce, and partly from the influx of strangers that flocked hither from Europe and Asia, their city became at length one of the most considerable and splendid in Greece; being adorned with a great variety of sumptuous buildings, such as temples, palaces, theatres, porticoes, cenotaphs, baths, and other edifices; all enriched with a beautiful kind of columns, capitals, and bafes, from which the Corinthian order took its name, together with numerous statues executed by the most famous artists. Such indeed were its wealth, magnificence, and excellent situation, that it was thought by the Romans equally worthy of empire with Carthage and Carpus. It would carry us far beyond our limits minutely to describe even the principal edifices that adorned this famous city; but in order to enable the reader to form some judgment of its extent and magnificence, we shall recite some few particulars, referring to Paunanius in cor. for a more ample account.

We have already observed that this city was seated at the foot of a high hill, on which stood the citadel. To the south it was defended by the hill itself, which is there extremely steep. Very strong and lofty ramparts protected it on the other sides. Its circumference was 49 stadia, or about 1 1/2 leagues; but as the walls extended along the sides of the hill, and surrounded the citadel, it might be reckoned upon the whole at 83 stadia or near 3 leagues. The road to the citadel had so many windings, that the summits could not be attained, without passing through an interval of 30 stadia. The situation of the citadel and its ramparts rendered it so strong, that it could only be taken by treachery or famine. At the entrance was the temple of Venus, with the statues of the goddess clad in brilliant armour, and accompanied by another of the god of love, and a third of the fun, who was adored in this place before the worship of Venus was introduced. In the way to the citadel was a chapel dedicated to the Egyptian Isis, and another to the Pelagian Isis. Two others were dedicated: one to Serapis of Canopus, and the other to another Serapis. The spring Pyrene, where Bellerophon is said to have found the horse Pegues, was ornamented with sumptuous embellishments, consisting of several caves in form of grottoes, all covered with white marble, from which the cold and limpid water of that fountain fell into a large basin. The forum was decorated with temples and statues; the theatre was a grand and beautiful edifice of white marble, in which the assembly of the people deliberated on affairs of state, and the musical contests and other entertainments were exhibited at the festivals. The Isthmian, or course, was also constructed of white marble. The temple of Neptune was a grand building; its avenue was lined on one side with the statues of all those athletes who had won the prize at the Isthmian games (which fee), and on the
the other with slaty pines planted in regular rows. The temple itself, though not very spacious, was adorned with a multitude of bronze Tritons, or sea-gods. Here were also the chariots of Neptune and of his wife Amphitrite, drawn by horses covered all over with gold, except their hoofs, which were of ivory. The two deities were carved in a standing posture, and Neptune had young Palaemon riding on a dolphin by his side. The bases of the chariots were likewise adorned with curious baso-relieves, and the temple itself with a multitude of other embellishments. Diana of Ephesus was also exhibited in a public place together with two gilt wooden statues of Bacchus. Fortune also had a temple, and her statue was made of Perian marble; and near this temple was that which was dedicated to the mother of all the gods. There were several other statues; among which we may select an Apollo, furnamed Clistus, in bronze; a Venus by Hermogenes of Cythera, two Mercuries, three statues of Jupiter, a Minerva in bronze, mounted on a pedestal, the baso-relieves of which represented the Muses. The city of Corinth abounded with public baths, the number of which was augmented by the emperor Adrian; but those of Neptune, constructed by Eurykles of Sparta, were the most famous. The temple of Venus at Corinth is said by Strabo to have been rich, that it maintained more than 1000 corsettants, who were devoted to her service, and which drew hither a multitude of strangers. The festivals of the Aphrodides were celebrated in this city by harlots, as we learn from Athenaeus (Deip. nos. i. xiii. c. 6); who also informs us, that they who supped with the goddess Venus, promised to dedicate some females to her rites, and they obtained what they required.

At first the commerce of Greece was carried on by land, and entered or left the Peloponnese by the road of the isthmus. The Corinthians took occasion to impose a duty on the transit of all commodities, and derived from this duty a certain degree of opulence. In order to avoid the dangers of the sea, proverbially stormy, between the ille of Crete and Cape Malea in Laconia, merchants chose to transport their goods to the seas terminating at the isthmus. Thus, the merchandise of Italy, Sicily, and the western nations, was landed at the harbour of Lechium; and that from the islands of the Aegean sea, the coasts of Asia Minor, and of the Phoenicians, at the port of Cenchrea. In process of time, commodities were conveyed by land from one harbour to the other, and means contrived for transporting even the velums. Corinth, having thus become the mart of Asia and Europe, continued to collect duties on foreign merchandise, covered the sea with ships, and formed a navy to protect her commerce. Her industry was excited and encouraged by success; the built ships of a new form, and first produced (triremes) galleys, with three branches of oars. Her naval force procured her respect; all nations poured their productions into her emporium. The sea was covered with rafts of paper, and failcloth, brought from Egypt, ivory from Libya, the leather of Cyrene, incense from Syria, Phoenician dates, Carthaginian carpets, corn and cheese from Syracuse, pears and apples from Euboea, Phrygian and Thessalian flaves, together with a multitude of other articles which were continually brought into the ports of Greece, and particularly into those of Corinth. The games of the isthmus also drew together to this city a prodigious number of spectators. These resources increasing the wealth of the state, workmen of every kind were protected, and exerted themselves with new emulation.

Corinth abounded not only with warehouses, but with manufactories of her own. Among other articles, the inhabitants made coverlets for beds, which were much sought after by foreign countries; she also collected a great number of the pictures and statues of the bell maidens. Her manufactories of brass and earthen ware were held in great estimation. Although Corinth possessed no copper mines, her workmen contrived, by mixing that which she received from foreign countries, with a small quantity of gold and silver, to compose a metal extremely brilliant, and almost proof against rust. (See $23.) Of this they made cuirasses, helmets, small figures, cups, and vellips; no less esteemed for the workmanship than for the material, which were enriched with foliage and other chased ornaments. Thoie on their pottery were equally beautiful.

The women of Corinth were admired for their beauty, and the men were distinguished by their love of gain, and of licentious pleasure. Venus was their principal deity; and the courtesans consecrated to her service, attended, in the time of public calamities and imminent danger, at the sacrifices, and walked in procession with the other citizens, singing facing hymns. The Corinthians, indeed, were so much devoted to traffic and luxury, that they very much neglected the encouragement of the liberal arts and sciences, and also of that spirit of glory and conquest, Torridized by their neighbours. Nevertheless, they cultivated a good discipline, both in peace and in war; and this their opulence, with its effects on their disposition and conduct, rendered absolutely necessary. Though they seldom, if ever, engaged in war, with a view of enlarging, but chiefly for the purpose of defending their territories, protecting some neighbouring state, or maintaining the liberty of Greece; yet this small kingdom furnished many brave and experienced officers to the other Grecian cities, who were frequently preferred to their own generals. The Corinthians were, in reality, the greatest protectors of liberty; and though they remained for some centuries under a monarchical government, yet they always manifested an aversion from tyranny, and an inclination to assist those who were opprefed.

We have already observed, that Sicyon was supposed to be the founder of the Corinthian monarchy; which is said to have continued in the lineal succession of his family, for seven or eight generations; till it became extinct, or till it was expelled the kingdom by Acilias, one of the Seven Rivals, about thirty years subsequent to their return, about B. C. 1074; in which family the kingdom of Corinth remained for a long interval, between three and four hundred years. Royalty was at last abolished, and the sovereign power was intrusted to 200 citizens, one of whom presided over the rest under the appellation of "Prytanis," about the year B. C. 779. About the year 659 B. C., Cypselus terminated this aristocracy, by usurping the sole government, and restored the monarchy, which he retained for about thirty years. He was succeeded by his son Periander, who held the government for 44 years. Having banished his son Lycophon to the island of Corcyra, the capital of which had been built by the Corinthians, in the year B. C. 763, Periander was reduced to the necessity of recalling him, but his proposals were received by the exiled son with indignation. He finally, however, resolved to abdicate the crown, and confine himself to Corcyra, whilst his son, quitting that island, assumed the reins of government at Corinth. But the Corcyreans, dreading the arrival of Periander, defeated this project by putting Lycophon to death, sentenced by an impartial judge. Periander died at 80 years of age, after a reign of 44 years. As soon as he had closed his eyes, the Corinthians destroyed every monument, and even the sight-
 Celt traces of tyranny. His successor reigned only three years; and after this short interval, the Corinthians, joining their troops to those of Sparta, established a government which, subsisting for a long period, and which approached nearer to an oligarchy than a democracy, no affairs were submitted to the arbitrary decision of the multitude. In the year 439 B.C. a war commenced between Corinth and Corcyra; and in the year 343 B.C. the Corinthians were defeated at sea by the Corcyreans, aided by the Athenians. And this contest between Corinth and Coreya, brought on the Peloponnesian war. In the year 395 B.C. the Athenians, Thebans, Argives, and Corinthians, formed an alliance against the Lacedaemonians, and this gave occasion to the Corinthian war. For an account of the alliance which Corinth afforded to the Syracusans, see the article TIMoleon. By the peace of Antalcidas B.C. 387, the Corinthians were obliged to withdraw their garrison from Argos, which then became free and independent. When Alexander entered Babylon, the Corinthians sent ambassadors to offer him the freedom of their city; and after a short stay in the city, the Persians were induced to accept it with joy, when he was told, that this honour had been conferred only on Hercules. When Aratus of Sicyon, prator of the Achaeans, had taken possession of the citadel of Corinth, B.C. 243, the Corinthians were prevailed upon to enter into the Achaean league; and about the same time they yielded a decree, that the Romans should be admitted to celebrate the Isthmian games, with the same privileges as the Greeks. At a subsequent period, B.C. 146, they inflicted the Roman deputies, commissioned by Lentulus to appease the troubles occasioned in Peloponnesus by the Achaean league; but upon the arrival of the consul Mummius, Corinth was besieged; and after the defeat at the battle of Lepanota, the consul entered the city, and abandoned it to be plundered by the soldiery. All the men who were left in it were put to the sword, and the women and slaves sold; and after the statues, paintings, and rich vestments were removed, in order to their being carried to Rome, the houses were set on fire, and the whole city was consumed. From that time the Corinthian braes, which was in reputation long before, became yet more famous; for it is pretended, that the gold, silver, and braes, which were melted, and which ran together in this conflagration, formed a new and precious metal. The walls were afterwards demolished, and raised to their very foundations. This dreadful calamity was inflicted by order of the senate, for punising the inofence of the Corinthians, who had violated the law of nations, in their treatment of the ambassadors sent to them by Rome. The booty taken at Corinth was sold, and it produced a considerable sum; no part of which Mammius retained for himself, but confounded the whole to Rome, for the purpose of being laid out in adorning the city. Among the paintings, which it is said there was a piece drawn by Anticles, the most celebrated painter in Greece, which represented Bacchus; the beauty of which was not known to the Romans, for Polybius had the mortification to see it used by the soldiery as a table, upon which they played at dice. In the sale of the booty, it was adjudged to Attalus for 600,000 solidi, or about 3625l. sterling. Many other statues and paintings of the most excellent matters, preferred in the wreck of Corinth, were transported to Rome. Upon Polybius's return into Peloponnesus, he had the painful and mortifying sight of the destruction and burning of Corinth, and the affliction of finding his country reduced into a province of the Roman empire. Corinth remained in a ruined and desolate state for many years. At length Caesar, after he had subdued Africa, and whilst his fleet lay at anchor at Utica, gave orders for rebuilding Carthage; and soon after his return to Italy, he likewise caused Corinth to be rebuilt. Strabo and Plutarch agree in describing the rebuilding of Carthage and Corinth at the instance of Julius Caesar; and Plutarch remarks this singular circumstance with regard to these two cities, that as they were taken and destroyed in the same year, they were rebuilt and repeopled at the same time. Under the eastern emperors, Corinth was the scene of an archbishop, subject to the patriarch of Constantinople. Roger, king of Naples, obtained possession of it under the empire of Emanuel. It had afterwards its own sovereign, who ceded it to the Venetians, from whom it was taken by Manomet II., in the year 1458. The Venetians retook it in 1667, and held it till the year 1715, when they lost it to the Turks, in whose possession it has remained ever since.

Corinth, in Modern Geography, Corinto, or Corinto, a town of Greece, in the Morea, situated near a narrow isthmus of the same name, which joins the Morea to the reil of Greece, between the gulf of Lepanto and that of Engin. It was formerly, as we have seen in the preceding article, a very rich and powerful city. At present it contains about 13 or 14 hundred inhabitants; each house has a garden, planted with orange and other fruit trees. It is 46 miles E. of Athens or Atti, and 342 S.W. of Constantinople. N. lat. 38° 5', E. long. 22° 55'.

Corinth, a township of America, in Orange county, in Vermont, W. of Braddock, containing 575 inhabitants.

Corinth, Isthmus of, in Ancient Geography, the neck of land which joins Peloponnesus (the present Morea) to the upper part of Greece, and which is computed to be about six miles wide. As this forms an obstacle to the passage from the Ionian to the Ægean sea, it has been frequently proposed to dig a canal through it, forming a juncture between these seas, and thus preventing the circumnavigation of the Peloponnesus. Pliny, who mentions this project, and who, without being superfluous, represents it as a rash attempt, alleges the unhappy end of four princes who lived about it, viz. D. Memmius of Philaea, Julius Caesar, Caligula, and Nero. When Nero undertook this business, superfluous discouraging the attempt; and it was said, that, at the first stroke into the earth, blood gushed out, that groans issued from the subterranean caverns, and that phantoms had appeared to the inhabitants of those parts. Nero, however, directed these idle tales, and determined to proceed. He encouraged the Pretorian soldiery in their work by perfiling allistance, and flattering hopes of success. The number of workmen whom he collected from all parts, and from all the gaols in the empire, was immense; and Vespasian, as Josephus informs us, furnished him with 6000 Jews, selected from a much greater number whom he had imprisoned. The work was begun on the side next the Ionian sea, at the port called Lechaion, and in 73 days an interval of four stadia was dug; and this was about the tenth part of the breadth of the isthmus. On the last of these days, Nero sent an order to discontinue the work. Two reasons were assigned for this change of opinion and purpose. By some it was said, that certain Egyptian mathematicians, whom the emperor had consulted, having taken the level of the two seas, east and west of Peloponnesus, found the waters of the Ionian higher than those of the Ægean sea; so that there was ground for apprehending that, if a communication were opened by a canal across the isthmus, the island of Ægina, and the low lands on the side of the Ægean sea, would be overflowed and destroyed. But this allegation is a mere pretence;
pretence; because these two seas do actually communicate southe of Peloponnesus, and therefore their waters must be on a level. Considering the pertinacious temper and extreme vanity of Nero, it is very probable that he would have perished, notwithstanding every objection of mathematicians, if he had not been alarmed by reports from Italy, where disturbances arose in consequence of his absence, and which made it necessary for him to return, so that he abandoned his enterprise. The news of a conspiracy at Rome terrified him exceedingly, and hastened his return. For an account of the games celebrated on this occasion, see *Eusthian Games*.

**Corinth.** Gulf of, now the gulf of Lepanto, commencing, as some of the ancients have said, at the isles called Oasis, having to the N. the mouth of the river Achelous and the Echimades, and to the S. the promontory called “Araxum Promontorium”; but, according to others, the gulf of Corinth denotes that portion of water forming a strait to the S. by the point called “Rhium,” and to the N. by that called “Anti-Rhimus.” This gulf extends eastward as far as Esotia. In the interior part, it forms two small gulfs; the one, advancing to the N., between parts of the Locride and Phocide territories, called, after the town of Crippa to the N.E., “Crisius Sinus;” the other was formed by the most eastern part of the gulf, and was called “Alcyonium Mare.”

**Corinthian brass.** See *Æs Corinthium.*

**Corinthian Order, in Architecture.** This is generally enumerated as the third of the Grecian orders, and forms the ultimate term of richness and elegance proper to that style of architecture.

The Corinthian order is principally distinguished by its capital, which may be described as consisting of a bell-shaped body, covered with an abacus of a quadrilateral plan, with convex sides; two tiers of leaves surrounding the lower part of the capital, between which little flanks or caulicoli rise up to the corners of the abacus, and those bending over form four volutes, and other volutes or ornaments occupy the centre of each side. Considerable varieties occur in ancient buildings; but this may be taken as a general analysis, which will include all Corinthian capitals.

The account, given by Vitruvius, of the origin of this order, has been already detailed in the article *Graec Architecture.* It must, however, be observed, that the Egyptian buildings present many capitals of a bell-form, decorated with leaves, which bear a sufficient resemblance to the Corinthian capital, to justify a supposition that this composition may have been derived from the imitation of an Egyptian model.

Callimachus, to whom the invention of the Corinthian capital is attributed, is supposed to have lived about the 6th Olympiad, or 540 years before the Christian era, which would give a very high antiquity to this order; but the first distinct account we have been able to find of its introduction in any building, is the following from Paulinus, l. viii. The ancient temple of Minerva at Tegea, in Arcadia, having been destroyed, a second edifice was erected, under the direction of Scopas, far exceeding in splendour and magnificence every building of the kind in the Peloponnesus. In this structure the three orders of Architecture were employed. Within the enclofure were galleries supported by Doric and Corinthian columns, surrounding the hypaethes or open area of the cella; and on the outside of the temple were porticoes of the Ionic order. This building may be dated in the fourth century B.C. To judge from the extant remains of this order in Greece, which are comparatively neither numerous nor important, we should say, that it had never obtained a degree of favour equal to the other two orders; but in the buildings of Rome, and in works in other countries under Roman influence and direction, quite the contrary is the case; and it is to these sources that we are to look for the best examples of the Corinthian order.

Vitruvius, l. 3. c. 1. in treating of this order, observes that Corinthian columns, excepting in their capitals, have their symmetry the same as the Ionic; but the height of the capital renders them proportionally taller, and more graceful: for the height of the Ionic capital is only a third part of the thickness of the column, whereas that of the Corinthian is the whole diameter of the shaft. The other members, which are placed above the column, are taken from the Doric or Ionic orders; for the Corinthian has no entablature peculiar to itself, but has either triglyphs, mutules in the cornice, and guttae in the epistylem, as in the Doric manner; or else, according to the Ionic disposition, the frieze is ornamented, and dentils are placed in the cornice: so that by these two orders, joined with a different capital, a third order is produced.

The preceding observation of Vitruvius, that the Doric entablature was sometimes applied to Corinthian columns, is in itself very extraordinary, and is not supported by any antique examples; but the remark respecting the Ionic entablature is found to be strictly true in a number of instances, as we shall proceed to shew by the description of the following examples:

The arch of Adrian at Athens. A cornice, with dentils, a plain frieze, an architrave, with three plain facias, and an Attic base.

The arch of Adrian at Rome. A cornice, with uncut dentil-band, a plain frieze, an architrave, with two plain facias, and an Attic base.

A building called the Incantades at Salonicha, the ancient Thessalonica. A cornice, with dentils, a swelled frieze, ornamented with flutings, an architrave, with three plain facias, an Attic base.

The temple of Vesta at Tivoli. A plain cornice, with uncut dentil-band, an ornamented frieze, an architrave, with two plain facias, and an Attic base.

The temple of Antonius and Paulina at Rome. A plain cornice, with uncut dentil-band, ornamented frieze, an architrave of two facias, divided by an Adragal, and an Attic base.

The portico of Septimus Severus at Rome. A plain cornice, with a small uncut dentil-band, a plain frieze, an architrave of three facias, divided by mouldings.

In all these instances, the entablature and base are entirely similar to those commonly observed in the Ionic order, from which those Corinthian examples only differ in the form of the capital; but in the examples which remain to be cited, it will appear that the Romans attempted to give to the Corinthian order a more distinct character, by appropriating to it a peculiar entablature and base, and thus made a complete order of what might be previously regarded, as Vitruvius appears to consider it, in the light of a complete invention.

The Portico of the Pantheon. A cornice, with modillons, and an uncut dentil-band, a plain frieze, an architrave of two facias, divided by mouldings, and a Corinthian base.

The temple of Peace at Rome. A cornice, with modillons and dentils, a plain frieze, and an architrave of three facias, divided by mouldings.

The three columns of the Campo Vaccino, supposed to belong
belong to a temple of Jupiter Stator. A cornice, with modillons and dentils, a straight frieze, an architrave of three facias, divided by mouldings, and a Corinthian base.

The temple of Jupiter Tonans at Rome. A cornice, with modillons and dentils, a straight frieze, and an architrave of three facias, divided by mouldings.

The arch of Constantine. A cornice, with modillons and dentils, a plain frieze, an architrave of three plain facias, and an Attic base.

A temple at Ephesus, supposed by Chandler to be the temple erected, by permission of Augustus, to the god Jupiter. A cornice, with modillons and dentils, a swell ed and ornamented frieze, an architrave of three facias, divided by mouldings, and an Attic base.

The temple at Nîmes called the Maison Quarré. A cornice, with modillons and dentils, a straight frieze, an architrave of three facias, divided by mouldings, and an Attic base.

To render this account of the progressive improvement in the Corinthian order more complete and satisfactory, some instances may be given, in which the alteration remains imperfect, having only taken place partially, with a great resemblance to Ionic forms.

A portico at Athens, supposed by Stuart to be the ancient Poikile. This building presents a cornice, with mutules of two square facias, an architrave, with two plain facias, and an Attic base.

The frontispiece of Nero at Rome. A cornice, with mutules of the same form as the half mentioned, an ornamented frieze, and an architrave of two facias, divided by an ogive.

In these two instances, there are no dentils or dentil-bands in the cornices; and the mutules, by their situation and shape, appear rather to be a variation from the proper Ionic dentil than a new member.

Considering the Corinthian order in its most complete state, we find it possessed of a peculiar entablature distinguished from that of the other orders by a cornice with modillons and dentils, a straight frieze, and an architrave of three facias divided by mouldings. The column is marked by its capital, and also by a peculiar base called the Corinthian base. This description is wholly applicable to the three columns of the campo Vaccino, which are probably the most complete and beautiful examples of the order existing. See Plate 29.

Of the modern architects, who have treated of this order, Palladio makes the column 91 diameters high, and gives only one-fifth part of this altitude to the entablature, which consists of a cornice with modillion and dentils, a straight frieze, and an architrave of three facias divided by Atralgals. The base is Attic. Scamozzi's design bears a great general resemblance to Palladio's, but he gives ten diameters to the column. The entablature is one-fifth of this height, the cornice has modillons, only the architrave consists of three facias divided by Atralgals, and the base is Attic. Serlio, in his Corinthian order, has followed Vitruvius in giving it an Ionic entablature with dentils, and in the proportion of the capital. The column is nine diameters high, and has a Corinthian base. Vignola's is a grand and beautiful composition in which he has chiefly imitated the three columns. He gives the column ten diameters in height with a Corinthian base. The entablature is one-fourth of the height of the column, the cornice has modillons and dentils; a plain frieze, and an architrave of three facias divided by mouldings.

The following Table will exhibit the proportions of some of the principal examples of the Corinthian order, premising that the different members are measured by the diameter at the bottom of the shaft, which is divided into sixty minutes.

<table>
<thead>
<tr>
<th>Temple</th>
<th>Height</th>
<th>Diameters</th>
<th>Cornice</th>
<th>Architrave</th>
<th>Frieze</th>
<th>Column</th>
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<tbody>
<tr>
<td>Portico</td>
<td>34 1/2</td>
<td>57 1/2</td>
<td>42 1/2</td>
<td>39 1/2</td>
<td>54 1/2</td>
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<tr>
<td>Temple of Velia at Rome</td>
<td>58</td>
<td>77 1/2</td>
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<tr>
<td>Temple of Velia at Tivoli</td>
<td>21 1/2</td>
<td>57 1/2</td>
<td>30 1/2</td>
<td>37 1/2</td>
<td>42 1/2</td>
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<tr>
<td>Temple of Antoninus and Faustina</td>
<td>5 1/2</td>
<td>68 1/2</td>
<td>43 1/2</td>
<td>40 1/2</td>
<td>52 1/2</td>
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<tr>
<td>Three Columns Campo Vaccino</td>
<td>6 1/2</td>
<td>66 1/2</td>
<td>43 1/2</td>
<td>43 1/2</td>
<td>69 1/2</td>
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<tr>
<td>A Building at Rome, commonly called the Basilica of Antoninus</td>
<td>11 1/2</td>
<td>50 1/2</td>
<td>43 1/2</td>
<td>32 1/2</td>
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<tr>
<td>The Arch of Constantine</td>
<td>37</td>
<td>53 1/2</td>
<td>15 1/2</td>
<td>10</td>
<td>58 1/2</td>
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<td>The Temple at Ephesus</td>
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<td>The Arch of Adrian at Athens</td>
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<td>The Incaetana at Salonica</td>
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"The Corinthian order," says Sir William Chambers, "is proper for all buildings where elegance, gaiety, and magnificence are required. The ancients employed it in temples, dedicated to Venus, to Flora, Proserpine, and the nymphs of fountains; because the flowers, foliage, and volutes with which it is adorned, seemed well adapted to the delicacy and elegance of such deities." This account, though plausible in theory, is wholly unfounded, and is, in fact, a mere modern refinement. The Romans, in borrowing their architecture from Greece, appear to have particularly appropriated the Corinthian order, they found it possessed of an ornamental character adapted to the splendour and magnificence of their taste, and used it indiscriminately on all occasions, and in the temple of any deity in the same manner that the early Greeks used the Doric, and the Ionians the Ionic order. Thus the Romans erected Corinthian temples to Jupiter, Neptune, and Mars; and the Greeks built the temples of the same deities of the Doric order. The temples of Minerva at Athens and at Siutium are Doric; the temple of Minerva at Frigie is Ionic. The temple of Jupiter Olympus at Elia, was of the Doric order; the temple of the same god, erected by Adrian at Athens, is Corinthian. The orders of architecture are national. Thus the numerous temples of the Grecian colonies in Sicily and Italy are uniformly Doric, marked by the most severe and maify simplicity. The cities of Jonia present the best examples of a chaste and elegant Ionic; while the magnificent structures of Balbec and Palmyra, are wholly of the Corinthian order, and in the most florid style of ornament.

CORINTHIANS, Epistle to the, in Biblical History, are two letters, addressed by the apostle Paul to the inhabitants of Corinth,
Corinth, including both Gentile and Jewish converts, and comprehended in the sacred canon of the New Testament.

Some have inferred from 1 Cor. v. 9, that the apostle had written another epistle to the church at Corinth; but Dr. Whitby (in loc.) observes, that no fathers ever ascribed to St. Paul more than 14 epistles, including that to the Hebrews; nor does Eusebius mention any third epistle to the Corinthians, amongst the true, controverted, or spurious writings which pass under his name. Moreover, no Christian writer ever cited any thing from this supposed epistle; and all the Greek scholiasts declare, that the apostle speaks in these words, "not of another, but of this very epistle," which, says Dr. Whitby, "is sufficient to justify the version I have given of these words. I had written, or was writing, in this epistle." Besides, his supposed epistle to Laodicea is cited as a book expounded by St. Jerom; his epistles to Seneca are in like manner cited by St. Jerom and St. Auftin; the acts of Paul are cited, and rejected from Origen and Eusebius; but none of them make any mention of more than two epistles to the church of Corinth.

The first epistle was written about three years after the apostle had left Corinth, to preach the gospel in other parts of Greece; and it was written at Ephesus, as appears from ch. xvi. 8, 9, 19, and Acts xviii. 18, 19, according to Pearson and Mill in the year 57, the third of the emperor Nero; but, according to Lardner's computation of St. Paul's times and travels, in the spring of the year 56, and this was also the opinion of Lennart and Beaufraire. This epistle was written in answer to some important inquiries proposed by the Corinthians, and for the purpose of correcting the various irregularities and disorders, of which they were guilty. The first article under the head of abuses, with which they were chargeable, related to the parties and factions into which they had fallen, and the opposition which was made by some of them to St. Paul's apostolical mission. The first four chapters comprehend this first head. The second topic which the apostle confines was the case of a notorious offender in the Corinthian church, who had been guilty of most scandalous incest with his father's wife. (See chap. v.) The third article which the apostle exhibits against the Corinthians is, that by a covetous and litigious temper they were led, in violation of the rules of Christian prudence and charity, and sometimes in opposition to the principles of justice, to persecute their brethren in the heathen courts. (Chap. vi. 1—11.) In the fourth place, the apostle cautions them against the sin of fornication, to which, in their Gentile state, they had been much addicted, and which some seem to have reckoned among things that were indifferent, or to consider as of inferior enormity; introducing useful reflections on matters of indifference, and illustrating the heinous evil of fornication from views peculiar to the Christian religion. (Chap. vi. 12 to the end.) As Corinth was conveniently situated for commerce, it abounded in riches, and was furnished with all the accomodations, elegancies, and splendours of life. Hence, by too natural a consequence, the inhabitants were led into luxury, lewdness, and all manner of vice; so that they became infamous even to a proverb. Thus, Kegiain 6wiv, a Corinthian woman, is, in the language of the ancients, a lewd prostitute, according to the proverb (cited in Erafm. Adag. Cest. 7. p. 633. 720.) & καθαρὴ ἡπετὶ κατεργασάμενη, at Corinthi eideris corpore qualem factura. And Kegiain 6wiv, Kegiain 6wivs, is ιδιονς, φαντασίων indiculare. (Hefych. Phavor.) We have already observed (from Strabo) that there was in it a temple dedicated to Venus, which πάοκες κατά τοῦ Χριστοῦ καικαί ονομάσει. See CORINTH.

Having thus largely, and with great fidelity and plainness, corrected some lamentable disorders which prevailed among the Corinthians; the apostle proceeds to the other principal object of his epistle, which was to answer certain questions which they had proposed to him. Here he determines, 1st, those which related to the marriage state; rating, that in some circumstances this state should be entered into, and continued in; but in others, forebore, particularly at that time; and enjoining wives not to depart from their husbands, and husbands not to dismiss their wives. (Ch. vii. 1—11.) He then shews, that marriages were not to be dissolved, as some thought they might, on account of a difference in religion; and he urges contentment with the divisions, in which they were called, whether they were married or single, bond or free. (v. 12—14.) And with regard to single persons, he affords the inexpediency of their marrying in the peculiar circumstances of the church at that juncture. (v. 25, to the end.) To the second query proposed, viz. how far they might comply with their heathen neighbours in "eating things sacrificed to idols," he replies, by reminding them that though all Christians might well be contented to know the vanity of those imaginary deities, to which the sacrifices were offered, yet it might prove an occasion of grief and scandal to some, if the profaners of Christianity should partake of those sacrifices in their temples; which, therefore, Christians would require them by all means to avoid. (Ch. viii.) He then, after waving, for his own part, the expectation of a maintenance from the Corinthians, states the right, which, as a minister of the gospel, he really had to be supported by those among whom he laboured; and this he argues both from natural equity, and scriptural principles. (Ch. ix. 1, to the end.) He next refutes the argument against partaking of entertainments upon "things offered to idols" in the heathen temples. (Ch. x. 1—13.) He proceeds to caution them against all approaches to idolatry. (v. 14, to the end, ch. xi. 1.) In reply to a third query, concerning the manner in which women should deliver anything in public, when urged to it by a divine impulse, he first settles this point; he then considers various circumstances relating to public worship and guards against abuses in the celebration of the Lord's supper, and also in the exercise of spiritual gifts; concluding with a recommendation and description of mutual charity. (Ch. xi. 2, to the end, ch. xii. ch. xiii. ch. xiv.) As some of the Corinthians doubted, and others denied, the resurrection of the dead, the apostle establishes this great and peculiar article of the Christian faith. (Ch. xiv.) He then closes the whole with some necessary counsels to the Corinthian churches and exhortations to fortitude and charity. (Ch. xvi.)

The second epistle of St. Paul to the Corinthians was written during his stay in Macedonia, whither he had gone from Ephesus, somewhat more than a year after his former epistle; according to Pearson in the year 57, and as Mill supposes near the end of that year; or, as Dr. Lardner conjectures, in September or October. (Ch. xi. 1—5, ch. xiii. ch. xiv. ch. xiii. 1.) It was conveyed by Titus, who was returning to Corinth in order to forward the collection intended for the poor Christians in Judea. Its evident design, in general, is to illustrate some of the same points upon which he had discoursed in the former, according to the information which the apostle had received from Titus concerning the circumstances and temper of the Corinthian church; and the writer interposes and enforces some occasional reflections and advice upon various subjects, which he thought most conducive to their instruction and edification. From a view of the epistle it is evident, that a great part of it is employed in reclaiming the Corinthian church from their undue attachment.
touching to judging teachers, and from that party-spirit, which they had indulged, and in recognising proper regards to the undiluted doctrine of the gospel, and to his own aposthecal counsel5. - This leading design of the epistle is interrupted by the occasional introduction of other matters, which can form no reasonable objection to the accuracy and beauty of this excellent composition; for the transitions arise from some obvious and important sentiments, which render them natural and just. In these digressions there is an admirable wisdom; because they relieve the minds of the Corinthians from that unsteadiness, which they must have felt from a constant attention to so disagreeable a subject as their unprofitable conduct towards the apostle himself.

It is in the same kind of propriety and sagacity, that the several intimations, which the dignity of the apostolic character obliged St. Paul to drop against those, who might perhaps in their opposition, are referred to the close of the epistle; as they would feel with additional weight, in all probability, after their minds had been softened with the reiterated expressions of his tender affection to the Corinthians in general, and the innocence and amiable features of his character had been represented in such a variety of views. See Doddridge's Exposition, vol. iv. Whitby's Comment. vol. ii.

We cannot close this article, without referring to some pertinent and judicious remarks, made by archdeacon Paley, in his "Horæ Paulinae," (an excellent work of original criticism and reasoning,) on the undesignated agreement or conformity that is manifest between these letters of St. Paul to the Corinthians, and the history of his life and travels in the book of Acts.

As it appears, from chap. vii. v. 1. that the first epistle was written to the Corinthians, in answer to one which he had received from them, this alone is a circumstance that favours the authenticity of the epistle: for it must have been a far-fetched contrivance in a forgery, first to have feigned the receipt of a letter from the church of Corinth, which letter does not appear; and then to have drawn up a fictitious answer to it, relative to a great variety of doubts and inquiries, purely economical and domestic; and which, though likely enough to have occurred in an infant society, in a situation and under an institution so novel as that of a Christian church then was, it must have very much excerted the author's invention, and could have answered no imaginable purpose of forgery, to introduce the mention of at all. Particulars of this kind are such as follow:—the rule of duty and prudence relative to entering into marriage, as applicable to virgins, to widows—the cafe of husbands married to unmarried wives, of wives having unmarried husbands—the cafe where the unmarried party choses to separate, when he choses to continue the union—the effect which their conversion produced upon their prior state, of circumcision, of slavery—the eating of things offered to idols, as it was in itself, as others were affected by it—the joining in idolatrous sacrifices—the decorum to be observed in their religious assemblies, the order of speaking, the silence of women, the covering or uncovering of the head, as it became men, as it became women. These subjects, with their several subdivisions, are so particular, minute, and numerous, that though they be exactly agreeable to the circumstances of the persons to whom the letter was written, nothing but the existence and reality of these circumstances could have suggested to the writer's thoughts. Another particular deferring of notice is, that in this correspondence the Corinthians did not say one syllable about the enormities and disorders which had crept in among them, and in the blame of which they all shared; but that the apostle's information, concerning the irregularities then prevailing at Corinth, had come round to him from other quarters. (Ch. 1. 11, 12, v. 1, 2.) That the Corinthians, in their own letter, exhibit the fair side of their conduct to the apostle, and conceal from him the faults of their behaviour, was extremely natural, and extremely probable; but it was a distinction which would not have easily occurred to the author of a forgery; and much less likely is it, that it should have entered into his thoughts to make the distinction appear in the way in which it does appear, viz. not by the original letter, not by any express obligation upon it in the answer, but diffusely by marks perceptible in the manner, or in the order, in which St. Paul takes notice of their faults. For the particular traces of unintended and seemingly accidental coincidence between the facts that are recited in the two epistles, and those that may be collected from the history, and which is altogether irreconcilable with a premeditated imposture or forgery, we must refer the reader, conversant with subjects of this kind, and desirous of farther information, to the work already cited, p. 72—151.

We may here observe, that there is another epistle of St. Paul to the Corinthians, besides the two above mentioned, purporting to be an answer to an epistle from the Corinthians to him. This was translated by Crisdenus, from a copy in the Armenian language, which had been sent to Mr. Whiston, and was afterwards, from a more perfect copy procured at Aleppo, published by his son, as an appendix to their edition of Mose Choremenes. No Greek copy exists of this epistle: it is not only unsupported by ancient testimony, but negative and excluded; as it has never found admission into any catalogue of apocryphal writings, acknowledged by, or known to, the early ages of Christianity. This epistle is an artful and specious forgery, introduced with a list of names of persons who wrote to St. Paul from Corinth, and preceded by an account, sufficiently particular, of the manner in which the epistle was sent from Corinth to St. Paul, and the answer returned. But they are names which no one ever heard of, and the account it is impossible to combine with anything found in the Acts, or in the other epistles.

CORINTUS, in Ancient Geography, a town of Greece, in Thessaly.—Alfeo, a town of Greece, in Epirus.

CORIO, in Geography, formerly a town of Piedmont, in Italy, belonging to the king of Savoy, is now a town of France, in the department of the Po, chief place of a canton, in the district of Turin, containing 5152 inhabitants. The canton is composed of 5 communes, and reckons in all 6764 inhabitants.

Cioriiana, Christofano, in Biography, a designer and engraver in wood, who is said to have been a native of Nuremberg, but who afterwards established himself at Venice. Heemskerck conjectures that his real name was that of Lederer, a family full existing in Saxony, and which Christofano might translate into Coriiana, according to the custom of those times.

Vafari informs us, in his Life of More Antonio, that Christofano engraved, from the designs of himself and his scholars, all the portraits prefixed to the lives of the different painters, sculptors, and architects in his extensive work; and that he continued to enjoy the reputation of an excellent artist at Venice, where he was established. If so, Christofano Coriiana cannot have been born to late as 1628, which Mr. Huber supposes. Besides the prints for Vafari, many of those in the Ars Gymnastica Harerogmi Mercudiana, the work of Ulysses Aldrovandini, are attributed to this master. But it is probable there were two artists of the same name. Huber.

Coriiana, Cav. Bartolomeo, supposed the son of the
the preceding artist, was born at Bologna, about 1599, and
is said to have parted himself in design by studying in the
academy of Caracci. Guido, however, seems to have been
the painter he most admired; and we are indebted to Bar-
tolommeo for several excellent engravings in chiaro-furo,
from the drawings of that graceful painter. These prints
were produced, like those of Ugo de' Carpi and Andrea
Andrea, by means of three blocks of wood; one of which
gave the outlines and the greatest depths of shadow, as if
liacated with a pen; the second, the middle tints; and the
third, the darker masses. He flourished from 1630 to 1670.
His prints are generally signed with his name, or with his
initials, viz., B. C. Eques.

Amongst his best prints are the following: "St. Jerome
before a Crucifix," a half length figure, dated 1649, after
Guido; "the Daughter of Herodias, with the Head of
John the Baptist," from the same; "the Fall of the Giants," a
large upright print on four sheets, from the same printer,
dated 1647; and considered the chef d'œuvre of Coriolano.

Henckien. Huber.

Coriolano, Gio. Batista, the younger brother of Bar-
tolommeo, was born at Bologna, about 1596, and studied
painting and design under Gio. Luigi. Valdevo. Some of the
tales of Gio. Batista exist in the churches of St. Anna and
the Annunziata, at Bologna. He is better known by his
numerous engravings in wood and copper, the former of
which are preferred by the connoisseurs.

We shall only notice the following prints by this artist,
who is said to have died in 1649: "the Portrait of Fortuna-
tus Licecutus," 1639, in 4to; "Chrift crowned with Thorns," a
middle-sized upright plate, boldly etched from Lod. Caracci. Huber.

Coriolo, Teresa Maria, filter to the two preceding
artists, after having acquired sufficient knowledge of design
from the instructions of her father, studied painting under
Elisabetta Sirani. She also amused herself with etching,
as appears by a small print representing the Virgin and Child.

Huber.

Coriolanus, Caius Marcus, celebrated in roman
history, was descended from the family of the Marci,
and in his early years he displayed uncommon courage and
nobleness of mind, united with strong passion and the pride
of high birth. He first distinguished himself in the war
against Tarquin, who was expelled; and obtained a civic
crown, for having preserved the life of a fellow-citizen.
For his successes over the Volscians, he was presented with
a fine horse richly caparisoned, and a tenth part of the spoil.
The former he accepted, but declined a greater share of the
booty than fell to his lot in common with others of the same
rank. As a further favour, he demanded the release of a
Volscian prisoner, who had been connected with him by the
tie of friendship, which was immediately granted; and the
name of Corioli was unanimously conferred upon him,
on account of his great services in the capture of Corioli,
the capital of the Volscians, which happened in the year 493
B.C. About this time dissensions prevailed between the
patricians and plebeians: Corioli sided with the former,
and was exceedingly fevere against the plebeians. For some
of his measures he was haimoned before the tribunal, to
which he paid no attention, till he conceived the safety of the
date required him to come forward in his own justification.
Indeed, however, of softening the resentment of the
people by submission, he aggravated their displeasure by the
heartiness of his behaviour. He was now conducted to
be thrown from the Tarpeian rock; but from this severe
punishment he was saved by the courage of the patricians, in
whose cause he had embarked. He was at length tried by
the people, to whom he appealed by the favour he had re-
cived in fighting for his country, and by the lives he had
saved in battle; but the tribunes succeeded in obtaining
against him a sentence of perpetual banishment. He heard
the decree without emotion, and with a calm countenance
took leave of his mother, his wife, and children; but the
ingratitude of his country made an indelible impression on
his mind. He was bent on revenge: he joined with the
enemies of Rome, took many of the towns, and encamped
within five miles of the city itself. The people now saw
their error, and a deputation was sent out to treat with him:
he received them with haughtiness, but would give them no
hopes of a reconciliation. To a second and third melleage of
the same kind he shewed himself inexorable. At length,
his mother, wife, and children, came out to plead their
country's cause. To their entreaties he could no longer re-
fuse his ear. Raising his venerable parent from the ground,
on which he had prostrated himself, he exclaimed, "You
have saved Rome, my mother, but you have destroyed your
son." He retired to his tent, and soon after took measures
for a retreat. When he had brought back the troops to the
Volscian country, he divided all the booty among the fol-
diers; on which account he is ingratiated himself with the
men, that his own want of resolution was forgotten. By
some of the historians we are told he lived to a great age;
though others maintain that he was slain in a tumult, excited
against him for yielding to the prayers of his country. Plu-
tarch.

Corioli, in Ancient Geography, a town of
Italy, situated in the country of the Volsci, of which it
was the metropolis. From this town, which no longer sub-
fited in the time of Pliny, Marcus took the name of Corio-
lanus.

Corios, a river of Asia, towards Carmania.

Coriophagematoedendorf, in Botany, Pluk.

See Myrica querisfola.

Coriovalium, in Ancient Geography, a town of
Belgie Gaul, on the route from Colonia Trajana, between
Tendurum and Jalucum. Anton. Itin.

Coris, in Botany, &c. (Diele.) Tourn. 652. Ap-
Lam. iii. 292. Juss. 2. 288. Class and order:
maeae, Vent.

Gen. Ch. Cal. one-leaved, ventricose, five-toothed, crown-
ed externally with strong sharp bristles. Cor. monopetalous,
irregular; tube the length of the calyx, cylindrical; border
flat, five-parted; segments obtuse, cuneate, entire, unequal.
Stam. five, bristle-shaped, shorter than the corolla,
decurrent; anthers roundish. Fil. Germ superior, round-
ifi; style filiform, the length of the stamina; stigma simple.
Peric. Capsule globular, placed at the bottom of the calyx,
one-celled, five-valved. Seeds numeros, somewhat egg-
shaped, small.

Efl. Ch. Calyx ventricose, with thorn-like teeth. Cor-
iosi monopetalous, irregular. Capsule five-valved, included in
the calyx.

Seeds several, about six inches high. more or less erect, cy-
lindrical, branched, cuneate, or oblong. Leaves scattered,
numerous, small, linear; the upper ones in the wild plant
edged with sharp prickly teeth. Flowers red or

5 C 2

white,
white, in dense, egg-shaped, terminal spikes. A native of
sandy shores in the south of Europe.

**Coris lutra**; C. Bauh. See Hypericum coris.

**Coris** is also used in the East Indies for a kind of shell
which packs for money. See Bia and Cowry.

**Corisco**, in Geography, two islands of that name
on the coast of Guinea, belonging to Benin.

**Corispernum**, in Botany. (from κορής, a bug, and
Claws and order, monandria digynia. Nat. Ord. Oleracese,

Gen. Ch. Cult. nonn; Linn. Schreb. Willd. (two-leaved;
leaves opposite, compred, acuminate, incurved; Lam.
Juss. Vent. Gen. t.) Cor. dipetalon; Linn. (none, Lam.)
Stem. Filament one, but in the lower flowers often from
two to five, filiform; anther roundish. **Fijil.** Cern superior,
egg-shaped, compred; styles two, capillary (one;
Gæst.) frigmas acute. Pers. nonn. Seed single, oval,
compred, flat or a little concave on one side, convex
on the other, with an acute margin.

Eff. Ch. Calyx or corolla two-leaved, or two-petalled,
one of them wanting. Seed single, elliptical, plano-convex,
with an acute margin.

1. Willd. 1. Lam. Illus. Pl. 5. "Flowers lateral; bracte
like the leaves, linear, smooth underneath." Root annual.
Stem scarcely a foot high, pubescent towards the top, red-
dish beneath, furfited, branched. Leaves alternate, entire,
with a white longitudinal nerve, and somewhat membran-
ous edges; lower ones two inches long, about a line
broad, ending in a long point, diminishing gradually to-
towards the top of the item, without affumig the form of
bracte. Flowers axillary within the upper leaves, sessile.
**Seeds** emarginate. A native of Russia and the south of France.

2. "Spikes lateral and terminal, squarrous; bracte
egg-shaped, short, mucronate, somewhat villous." Root annual.
Stem a foot high or more, much branched, panicled, zig-
zag, cylindrical, almost smooth, greenish, with pur-
ple stria; lower branches almost decumbent. Leaves about
two inches long, alternate, linear, smooth, nearly
equally distant from each other. Spikes an inch long or
more; bracte very different from the leaves, with white
membranous edges; flowers sessile. Seeds not emarginate.
A native of Tartary and Siberia. There is a variety, per-
haps a distinct species, found in the south of France, with
weaker items and more slender generally terminal spikes.

3. C. orientale. Lam. 3. "Leaves long, narrow, linear;
flowers somewhat panicled, growing only at the ends of
the branches." Root annual. Stems about a foot high, flender,
reddish at the base, branched. Leaves narrowing towards the

**Corispernum folia opposita**; Fl. Lap. Gron. See Calli-
triche.

CORITA, in Geography, a town of Spain, in the prov-
ince of Leon; 17 miles S.S.W. of Leon.

CORITANI, or Coricenti, inhabitants of ancient Al-
bion, were situated to the W. and N. of the Iceni, and,
according to Camden, were the ancient inhabitants of the
country, which is now divided into Northamptonshire,
Leicestershire, Rutlandshire, Lincolnshire, Nottingham-
shire, and Derbyshire. Other antiquaries, however, are of
opinion that their territory was not so extensive.
The name of the Coricenti plainly indicates that there was some
kind of affinity or connexion between them and their neigh-
bours, the Iceni. Some think they were two tribes of the
same nation, and that Cor-Iceni denotes the lesser Iceni,
from Carr, a dwarf, and Iceni. Others imagine that both
these British tribes derived their name from the different
kinds of animals which constituted their chief riches, and
the tending of which was their chief employment; the
Iceni from Uthesh, oxen; and the Cor-Iceni, from Corr, a
sheep. However this be, if the two tribes did not form
one nation, they were in very strict alliance, and shared
the same fate; having been both reduced to some degree of
subjection to the Romans by Oltorius Scapula, and totally
fudged by Sustonius Paulinus. The Romans made great
changes in the country of the Cor-Iceni, by introducing
agriculture, and by building many forts and stations in it
to keep them in subjection. Lindum, now Lincoln, the
ancient capital of the Cor-Iceni, became the seat of a
Roman colony, and one of the most considerable cities which
these people had in Britain; and it is mentioned both by
Ptolomy and by Antoninus in both his journals. By fol-
lowing the course of the 6th journey of Antoninus, from
London to Lincoln, we meet with a considerable number
of Roman towns and stations within the territories of the
Cor-Iceni; as Venonze, now Clayce; Ratz, now Le-
celler; Virometum, now Willoughby; Margidunum, now
East-Bridgeford; Ad-Pontem, now Southwell; and Cro-
coiana, now Brugh, near Cottingham. The extensive coun-
try of the Cor-Iceni was included in the Romae province
called Britannia Prima.

CORITHUS, or Corythus, a town and mountain of
Italy, in Etruria, according to Servius on Virgil; but
Cluver thinks that Servius is mistaken; and that if such
a place existed, it must have been in the country since
called Cortona.

CORITIM, a town of Asia, towards Syria; placed
near the Euphrates by William of Tyre.

CORITUS, a mountain of Italy in Umbria; now Monte
Corvo.

CORIUM, a place in the isle of Crete, near the lake or
marsh called Coreium.

CORIUNDI, a people of Hibernia, according to
Ptolemy.

CORIUS, a river of Carmania.

CORIZENSIS, an episcopal see of Asia, in the pa-
triarchate of Antioch.

CORIZIOLA, in the Materia Medica, is a name given
by some authors, particularly by Rhus, to the scam-
mony.

CORK, the exterior bark of a tree belonging to the
genus of oak (Quercus Saber), which grows wild in the
southern parts of Europe, particularly France, Spain, Por-
tugal, and Tucany. When the tree is about 15 years
old, it is fit to be barked, and this can be done successively
for eight years. The bark always grows up again; and
its quality improves as the age of the tree increases.
If care is not taken to strip the bark, it splits and peels
off by itself, being pushed up by a second growth forming
under that of the preceding year.

**Stripping and preparing the Bark.**—The bark is taken
off by the Portuguese in sheets or tables, by cutting it with
knives having two handles, similar to those which the tanners
or flinders use at their beam, or horse, slitting it down after
the circular incision is made, from top to bottom; to effec
this incision they ascend the tree by a ladder to the part
where the branches spring from the top; they then make
a slice or flipo; the filaments connecting the bark with the
trunk are next cut down, or through, by a knife formed
like our hay-fade, and which they use in nearly the same
manner: the bark is frequently, through hale, broken off
at
C O R K.

at the root, in which case the two ends are distinguished by the appellations of "cut end" and "fall end," the first is that which had been at the top of the tree, where the circular cut was first made, and the second is that which had been next the ground.

Another mode of accomplishing the artificial stripping of the tree, is thus performed: several incisions are made from the top of the trunk to the bottom, and at each extremity of these incisions a circular cut is effected; by this operation the bark is cut off from the tree with either the lower or higher parts of the tree; consequently it is entirely deprived of support, in a little time it loofens, and its separation is completely accomplished by the hand; thus the progress of nature is expedited by very simple means. Before the operation of barking is again performed upon the same tree, should it be a young one, it ought to stand three years; it is not however unfrequently cut within the period; when it is cut too young, it is generally preferred by the English cork-cutter in his cellar till it alters from green to the colour proper for its purpose, which is effected merely from the time he keeps it in that state, though after all, it is still much inferior to that taken when the tree has arrived at maturity.

After being detached from the tree, the Portuguese "burn it," laying the convex side of the bark to the fire; in this operation they are careful to cover all the blemishes they possibly can, holes are filled up in an insufficient manner either by the swelling and straightening of the wood upon the fire, or by the artful introduction of foot and dirt. When the judgment of the burner is sufficiently exercised in straightening the bark, and artificially repairing its defects, it is laid into the farm yard for sale, in sacks, and bought by the merchants from thence for exportation.

Another method used in straightening the bark, is to pile it up in pits, loaded with heavy stones, by which method it becomes flat, this is afterwards more completely effected in a damp cellar, and is called "laying the cork." When this operation is finished, it is dried over a strong fire in what is called "a burning yard." From negligence in this process it receives too much of that black colour which is so frequently discovered in articles made of cork; when sufficiently dried it is ready for flacking.

The cork is not burnt, but only charred on each surface; previous to this operation the pores of the bark are open, and its consequent porosity of texture would make it not only give too much way to the knife; but particularly in the case of "taps" and "bungs" would render it a filter, rather than a preferer, of liquids. It shrinks with the application of moderate heat, and thereby closes the pores, by which any filtration might be effected. If "burning" ever be used as a cover for defects, it is not an original design but an accidental advantage, which is taken of a necessary procès; "bungs" and "taps" are always charred on both surfaces; good bottle corks, though the bark of which they are made is likewise subjected to the operation of fire, do not after they are cut exhibit any marks of that element, being cut in the length way of the wood, the pores lie in a contrary direction, and the charring consequently is taken off by the process of rounding them.

The tree cork as well as the ufe to which the bark is applied, &c.—This tree, as well as its ufe, was known to both the Greeks and Romans. By the former it was called phellos. Theophrastus reckons it among the oaks, and says, that it has a thick flaky bark, which must be stripped off every three years to prevent it from periling. He adds, that it was so light as never to sink in water, and on that account might be used with great advantage for a variety of purposes. That the fiber of the Romans was our cork-tree is generally and justly admitted. Pliny relates of it every thing said by Theophrastus of the phellos; and from his account we learn, that at the period when he wrote, cork was applied to as many purposes as at present. At that time fishermen made floats to their nets of cork; that is, they affixed pieces of cork to the rope which formed the upper edge of the net, in order to keep it at the surface of the water. Another ufe to which cork was applied, according to Pliny, was for anchor-buoys. "Ulus ejus ad corollum maxime navium," that is, as this passage may be interpreted, it was ufed for making buoys, called "Ancoralia," which were fixed to the cable, to prevent it from floating on the surface of the water, over the anchor, pointed out the place where it lay. Our navigators ufe for that purpose a large but light block of wood, which, in order that it may float better, is often made hollow. See Buoy.

Another ufe of cork among the Romans was for being made into soles, which were put into their shoes, in order to secure their feet from water, especially in winter; and, as high heels were not then introduced, they served the purpose of elevating ladies and making them appear taller than they naturally seemed. The practice of employing cork for jackets to affiff in swimming is also very ancient; for we are informed, that the Roman whom Camillus sent to the capital when befleged by the Gauls, put on a light drefs, and took cork with him under it, because, to avoid being taken by the enemy, it was necessary that he should swim through the Tiber. When he arrived at the river, he bound his clothes upon his head, and placing the cork under him, was so fortunate as to succeed in his attempt. The most extensive and principal ufe of cork at present is for flappers to bottles. To this purpose it is excellently adapted; because it is very light, may be easily comprized, and expands again by its elasticity as soon as the pressure upon it is removed, and, therefore, it fills and stops up very closely the space into which it has been driven by force. Besides, it may be easily cut into all forms; and though it abounds with pores, which are the cause of its lightness, it suffers neither water, beer, nor any common liquid to escape through it, and it is but slowly and after a considerable interval that it can be penetrat ed even by spirits; its numerous pores seem to be too small to afford a passage to the finest particles of water and wine, which can with greater facility coze through more compact wood that has larger or wider pores. This ufe of corks was not altogether unknown to the Romans; for Pliny expressly says, that it served to stop vessels of every kind, and influences of its being employed for that purpose may be seen in Cato (De Re Rustica, cap. 120.) and Horace (lib. iii. ed. 8. 10.) its application to this ufe does not cease, however, to have been very common as other substances have been generally employed for this purpose. Stoppers of cork seem to have been first introduced after the invention of glass bottles, of which no mention occurs before the 15th century. See Bottles.

This wood is still formed into soles for shoes, into corks and bungs for stopping bottles, &c. into a floatage for the nets of fishermen; it is employed generally, though perhaps with a considerable degree of error in teaching the art of swimming; it is also ingeniously ufed on account of its lightness, when an amputation of the human leg has been necessary, to supply the deficiency; the Spaniards line stone walls with it, which not only renders their houses very warm but corrects the moisture of the air; the Egyptians made coffins of it, which being covered in the inside with a redous composition
position preferred their deal boat. It is burnt to make that light black substance, called Spanish black, from its having been first made in Spain.

Cork bark has not only been applied as above, but also in the preservation of life, when endangered by shipwreck; the most conspicuous exhibition of its advantages is in the application of it in the construction of the "life boat" or "cork boat," as it was originally called. We have under the article boat, life boat," given our readers a short account of that invaluable invention; since which we have procured a very valuable account by the principal secretary of the meeting who first advertised the reward; we have also obtained from the liberality of Mr. Greathead, and the interpell of the gentleman alluded to, a plan or section of the boat, drawn by the original inventor, which will be given under the article Life Boat.

A cork jacket too has been revived from an old German discovery, by Mr. Dubourg; to preserve the lives of persons in danger of drowning, which is constructed as follows. Pieces of cork about three inches long, by two wide, and the usual thickness of the bark, are inclosed between two pieces of strong cloth or canvas and formed like a jacket without sleeves; the pieces of cloth are fastened together round each piece of cork, to keep them in their proper situations; the lower part of the jacket about the lips is made like the same part of women's flanks, to give freedom to the thighs in swimming; it is made sufficiently large to fit a robust man, and is fastened to the body by two or three strong tapes fastened far back on each side, and tied before; the strings are thus placed to enable any wearer to tighten it to his own convenience.

Cork in its action has the elasticity of a spring, and when pressed into any aperture, it exerts a force acting outwardly on all sides from the centre. It is this quality that makes it valuable in flushing out the external air from fissures, and elastic fluids; and it is fitted for this purpose in a degree proportioned to the impermeability of its pores. The elasticity of cork has also been employed for many other purposes in the arts; it forms the spring of the lighter in ordinary candlesticks, and where the frame is not heavy, it can be made into a good substitute for the pulleys and weights of the sashes of windows. See Candlestick and Windowsash.

Other vegetable productions have likewise been occasion-
ally employed possessing qualities similar to cork. The spon-
dias lutis, a native of South America, which flourishes in moist situations, and which is there called monibon or mon-
bun, is sometimes brought to England, as a substitute for cork. The roots of liquorice are applied to the same use, and on this account, as well as its medicinal properties, is much cultivated in Schelovia, and exported to different countries. The tree called myrtif, which is found in North America, has also been applied to similar purposes.

Cork-cutting, or the Manufacturing of Corks. This business, though it is thought one of the most dirty, is not one of the least profitable; it is likewise easy in the acquire-
ment. The cork, after being pressed into square pieces, as above noted in the treatment of the bark, is received by the cork-cutters, and if not sufficiently flat for their purpose, they "lay" it again over a fire in their "burning yard," turning the convex part to the flame; the heat by twisting the edges of the bark, counteracts the natural bend, and compels it to receive a flat form. During this operation, a considerable degree of attention is paid to smoothing it, and particularly again to cover its defects. It is next cut into lrips, narrow or wide, according to the intended cork, long, or tap, for such are the names of the general divisions in this business. The use of the two former is well known, the latter is used for stopping the top-holes of barrels, as the name implies. These strips are again cut into squares, of a length proportioned to the use they are intended for. This operation is performed by one man, from whom they are handed forward to several others. A further division of corks takes place, of these different sorts according to their lengths, and are denominated "short," "short long," and "for longs.

The cork maker places himself before the table or plunk, on which is fastened a board about three inches thick, four broad, and twelve long; immediately on a line with his left hand is a piece of wood, rising about four inches from the board, and fixed about the middle of it, on which the cork is laid, after being cut as above. This wood not only supports the cork, and is as a guide to the workman, but by its elevation above the board, gives room for the knife to cut a part of the cork in a smooth and circular manner, without slanting on the table below. The piece is then turned to where the left cut ceases, and this is continued until the knife has gone completely round; the top and bottom are then pared level, and the cork thrown into a box or basket, with the rest of the same length. As the bark is not of the same quality throughout each piece, the corks are sorted by a boy into four kinds, "superfine," "fine," "common," and "coarse," and are sold accordingly.

The only tool employed by the cork-cutter is a knife about three inches broad in the blade, and about six inches long, very thin and sharp, and equal in breadth from the handle nearly to the end, which is finished by a gentle curve. This knife be sharpened upon the board where the guard is placed, by one whet or fiddle on each side, after every cut, and now and then upon a common whetstone.

From the foregoing it is evident, that the art of a cork cutter is principally to obtain a regular, round, and quick turn of the wirh, in guiding the knife so as to complete a pretty correct circle, and to make a smooth surface; it is on this account that the knife will be particularly sharp, to enable the workman to turn it with ease.

The parings of the cork are carefully kept, and sold to the dry colour makers, to be burnt into Spanish black.

It may be supposed that those who give the detail of any manufacture would be the best able to point out improvements in it, though this is not always the case; yet one improvement in the "laying" of the cork wood, appears of great importance to the writer of this. In the present mode, a great deal of time is lost in placing and removing the flumes used to flatten the cork; and though the weight may be moderated or introduced by degrees, yet it cannot be done in that regular manner which appears the most likely to effect the purpose. In addition to which it may be observed, that in proportion as the weight is carefully applied, will be the risk of breaking those pieces which must partake of the circular bend of the tree. To remove this inconvenience, and to do away the c'd, grief, and cumbrous method, a few might be used, such as that employed by the printers in mending their work; by its operation a gradual inclination would be given, the former objections done away, and a much nearer and workman-like method adopted.

Cutting the cork into strips might also be accomplished with much greater facility; the whole breadth of the cork might be cut by one stroke, by means of semi-circular knives, like small shee knives, at certain distances, in a frame, which, by being affixed to a pole, with a cross bar as a handle, might be driven through the whole breadth in the
the same time that a single flip is cut by the present method.

**Cork.** Acid of, in Chemistry, a yellowish thick acid matter obtained by distilling four times its weight of nitrous acid from cork. This is soluble in water and has an acrid bitterish taste. It does not crystallize, but becomes a certain like wax by evaporation; it is soluble in ardent spirit; forms deliquescent salts with the earths and alkalis; and has as strong an attraction for lime as the acid of sugar.

**Cork. Mountain, Suaber montanum, or Corium montanum, in Mineralogy,** a species of the vivistic genus of earths and stones, according to the arrangement of Kirwan (Mineral. vol. i.) Its colour is white, or reddish-white, or yellowish-grey, or ishlera, or ochre-yellow, or yellowish-brown. It is found either in thick compact pieces, and then called "mountain cork;" or in thin flat pieces, then called "mountain leather or paper;" or cellular, and then called "Caro montanis, &c." The luidre is o., rarely 1., and transparency 5. Its fracture presents fibres confusedly intersected with each other, sometimes so subtle as to be dissimilar with difficulty, and thus they give the fracture a compact earthy appearance. (Bergman, vol. 3.) It takes an impression, or yields like cork to the finger, and is somewhat elastic. Sp. gr. before it is penetrated by water, 9.068 to 9.093; and after admission of water, from 1.4292 to 1.4342. (Drifton.) It perfectly dry, and sufficiently thick, it gives a found when struck. It finishes meagre. Bergmann and Saussure find it soluble, though with difficulty, by the blow-pipe. By Mr. Bergmann's analysis it contains from 56 to 62 per cent. of fixed, 22 to 26 of aërated magnesia, from 2.5 to 12.7 of argill, about 3 of calx of iron, and from 10 to 12 of aërated calx.

**Cork-paper, in Mechanics.** Fig. 1. Plate XVII. Mechanics, is a simple cork-screw, consisting of a screw, A, turning in a female screw attached by two small rods to the collar B, which receives the neck of the bottle from which the cork is to be extracted; the two rods have a groove in them to receive the eads of a cross-piece, connected with the cork-screw, and prevent its turning round with the screw A.

**Fig. 2.** is nearly the same, except that the nut, B, is turned instead of the screw.

**Fig. 3.** is called the neo-pler-alera cork-screw; it consists of two cork-screws A, B, one within the other; the screw which enters the cork is fixed to the innermost one. In using this instrument both screws are screwed up to their shoulders, and the whole is turned round together without permitting the frame to turn, till the cork is drawn. The handle is then turned the contrary way, and the screw drawn out of the cork by means of the small screw B.

**Fig. 4.** is a screw of nearly the same kind, a rack and pinion being substituted for the screw B.

A cork-making machine is represented in fig. 5; in which A is a tredle to be worked by the foot; it is connected by a rod d, with an iron-roller D; the bottle to be corked is placed in a heathen cæf E, fastened to a board finding in a groove; the cork is inserted, and the bottle slid under the lever D, the foot is then placed on the tredle, and the cork forced in; the corks are ferr pinched by placing them under the lever at d, to make them enter easily.

**Cork-tree, in Botany.** See Quercus Sylvis.

**Cork.** in Geography, a county of Ireland, in the province of Munster, lying in the south-western extremity of the island, and by far the greatest in extent and population. It has the Atlantic ocean on the south and south-west; the county of Kerry on the west: those of Limerick and Tipperary on the north, and that of Waterford on the east. Its greatest breadth 50 miles (71|₂ English); and its greatest extent 98 miles (71|₂ English), containing 1,048,800 plantation acres (1,658,920 Eng.); and being about 16,5 (or 2,653 English) square miles. The number of houses, according to an official return made to parliament in 1791, was 75,739, and they must have since considerably increased. From this population has been estimated at 416,000, which is allowing 9.6 to a house in the city of Cork, and 5.6 to a house in other parts of the county, which those who are acquainted with the many populous towns in this country, and with the manner in which the cottages are crowded, must admit to be a very moderate computation. According to this statement, which is taken from Dr. Beaufort, the county of Cork contains very nearly a tenth-part of the number of acres in all Ireland, and above a tenth-part of the whole population. For not only its absolute population is the greatest, but its relative population is amongst the most considerable, being nearly the same as that of Antrim and Londonderry, and exceeded only by the very populous districts of Armagh, Monaghan, Down, Louth, and Dublin. It cannot therefore be wondered at, that it has three militia regiments to keep up. The number of parishes is 269, in which there are 105 churches. The bishopric of Cork, Ross, and Cloyne lie entirely within the county, and all the above parishes belong to them except five. Cork returns eight members to the imperial parliament, viz., two knights of the shire, two for the city of Cork, and one each for the boroughs of Kinsale, Youghal, Bandon, and Mallow. In so large a district there must be a great variety of soil. It contains more good land than bad, and some parts of the county are highly cultivated, especially the neighbourhood of the Blackwater, and the barony of Imnlhale, which is the seat of the baronies of Cork and Kerry, in which are the Shiel mountain, which are the poorest and the best improved. The whole county is hilly, and, a few places excepted, very defatted of trees, which is the consequence of the small number consumed in the iron-works in the 17th century, without new ones being planted. There are however some flats which are richly wooded. The Gaetees and the Waterford mountains bound it on the north-north. The Nagle mountains and the Bogre which run through the heart of the county, though separated from each other by a long valley, may be considered as part of a range, that is continued with few interruptions from Helwick Leed in Waterford, across the counties of Cork and Kerry to the ocean. On the north of this range lies a narrow plain, which extends from the bounds of Tipperary to Dingle-bay. The rocks most common in this country are argillaceous. A coarse red or grey sandstone, often varying to a coarser and more flaty fracture, forms the greater part of the coal and the hills near it. There are in this very strata of slate, some of good quality for roofing houses. A large vein of limestone intersects the red argillite, commencing in the peninsula of Corhse and the islands in Cork harbour, and extending on the south side of the river Lee to its junction with the Bride, and thence through a valley adjoining this latter river to the distance of about 12 miles from the city of Cork. This limestone, in an evident secondary as it contains a variety of petrified shells, and much of it on scaping has that disagreeable fœst which characterizes Silex flint. This district contains some marbles which admit a good polish. In some of the limestone quarries near the city of Cork, there are not only very transparent quartz crytals, but also large amethysts which are
are much esteemed by the jewellers. The bottom of Bantry bay is entirely composed of broken pieces of coral, called coral sand, which is found to be an excellent manure. In Carbery there is a magnesian limestone. On the Cork side of the Galtree there is abundance of fine limestone, and this useful article may be procured on moderate terms in every part of the county. The Galtree mountains themselves consist of a very coarse pudding stone, in which is much iron shot quartz. Near Galway, on the estate of the countess of Kingsfort, is the remarkable cave of Skheenrinky, which is deemed by Mr. A. Young superior to the peak. (See Michelstown.) The county of Cork abounds in fine rivers, and good harbours. The Blackwater rises in the mountains between Limerick and Kerry, and flows eastward through this county, receiving the Awbeg, the Funchem, the Bride, and many smaller streams in a course of 80 miles. The Awbeg is the Mulla of Spenfer, who resided at Kilcooleem-castle, not far from its banks, and the Blackwater is the Awednoff of the same poet. On the banks of the Blackwater are many fine orchards remarkable for the cider procured from them; and several handsome seats. It is navigable from Cappoquin in the county of Waterford, where it turns to the southward, and disembogues itself in the harbour of Youghal. The Lee issues from a lake called Gougane-Barr; which is, according to Smith, a most elegant and romantic spot, and has by some been preferred even to the lake of Killarney. This lake is well of Inchigelech, by which town the river paifes, and thence to the city of Cork, above which it divides into two branches which unite below the city; and it contributes much to the wealth and prosperity of that great commercial town. The passage down the river from Cork to the outer harbour consists of a succession of varied and beautiful scenery, which can scarcely be surpassed. The Bandon is another fine river, which, after watering the large and thriving town of Bandon-bridge, and the village of Inishman falls into the harbour of Kinsale: it is navigable for large vessels as far as Inishman, between winding banks which still decorare the character given them by Spenfer; "the pleasant Bandon crowned with many a wood." The whole coast of Cork is broken into creeks and bays. The harbour of Corkhaven, near Mizen-head, the south-west point of Ireland, is often referred to, when the easterly winds prevent vessels from gaining the harbour of Cork. Bantry-bay, a little to the north of this cape, is, at least, 30 miles long, and from three to five miles wide, with deep, sheltered, and free from rocks. For particulars of these harbours, and of the many towns which this county contains, the reader must be referred to their respective articles. At Dromagh and Dromana, in the barony of Duhallow are coal-pits, which are worked, but not in a judicious manner, or to much advantage. There is much ironstone, and there were many furnaces; but the dearness of fuel is a great check. Much linen is woven about Dunmanway, which is purchased by merchants in Bandon, and shipped from Cork. Near Bandon is a very extensive cotton mill, which gives employment to great numbers. There are some other manufactures, but none of much consequence, except those which belong more properly to the account of the city of Cork. The peastans in the county are very thickly distributed. In many parts they are very dependent on their landlords, working for them at a low price in payment of the rent of their cottages, and the small lot of ground adjoining them. This has been called the Cottar system. The cottages in general, though bad, are not so wretched in appearance as in some other counties, and with scarcely a single exception have a small garden for cabbages, as well as a field for potatoes, attached to them. The last supplies them with the principal article of their food. They all have a pig, and some of them several, in which last case they generally kill one for themselves at Christmas. This animal, as well as some poultry, often inhabits the same dwelling with its owner, though, of late, pig-fyres are becoming more common. There is a dachshund formed before the door of every cottage, which has a disagreeable appearance; but it is often the only place the owners have for laying up manure for their potato gardens. Shooting is the general business of the women, and notwithstanding the severe remarks that have been made on the laziness of the lower Irish, they are seldom seen idle. They spin more wool than flax. The middling and lower farmers have, of late years, improved much, both in their wealth and manner of living, and there is reason to expect further improvement, if the encouragement to agriculture continues, and the peace of the country be undisturbed. The system of agriculture, however, in life, is very bad, and much praise cannot be bestowed on the great landholders for their exertions to improve it. Cork partakes, with other counties of Ireland, the evils arising from abentees, some of the greatest proprietors being of this class; yet few counties have so great a proportion of respectable residents. With respect to the history of this county, we may observe that it was a kingdom of itself before the arrival of the English, and was governed by the McCarts. A descendant of that family, on resigning his Irish title of M'Cartmore, was made by queen Elizabeth, earl of Clancarty, a title which was attainted soon after the revolution, in consequence of the attachment of the evil to the dethroned monarch. Henry II. granted the whole kingdom of Cork by charter to Robert Fitz Stephen and Milo de Cogan, about the year 1177; but they were able to get possession only of a small part of it. It is unnecessary to trace the various changes of property which took place from forfeitures and intermarriages. It may be right however to mention that queen Elizabeth divided a great number of acres, which had been forfeited, among various undertakers, who agreed to introduce English tenants. Sir Walter Raleigh had three seigneuries and a half given to him on this occasion, which he sold, in 1603, to Sir R. Boyle, afterwards the first earl of Cork, who was a great improver, and founded several towns. This property now chiefly belongs to the duke of Devonshire, who is the representative of the elder branch of the McCarts family. Many of Cromwell's officers afterwards obtained settlements in this county. Beaumont's Memoir. Young, &c. &c.

Cork, the second city of Ireland, and capital of the county of the same name, was originally built on a low marshy island, formed by the branches of the river Lee, from which circumstance its name is said to be derived, corcaigh, in Irish, signifying a moor or marsh. It appears, from the imperfect account we have of the early periods of Irish history, that in the 5th, or, as Ware says, in the 7th century, there lived a pious hermit called Barroc, or Fin Barroc, and in after ages, St. Fin Barry, who founded a monastery for regular canons of St. Augustine, and a school on the south side of the river Lee, near the place where the present cathedral stands; and that his name drew such numbers to it, that to use the words of Colgan, "it changed a desert into a city." In the 9th and 10th centuries, this monastery and town were often plundered by the Danes, who then infested Ireland; but, at the beginning of the 11th century, they founded the present town in an island of the river, of an oval shape; and called it either from the name of the town they had burned, or the marshy situation, Cor-...
CORK.

252. It was, however, very small, and probably did not contain above 1000 inhabitants; but the creeks which interfered it, were convenient for mooring the Danish vessels, and thus their merchandise and plunder were secured. On the arrival of the English in 1172, Cork became an English colony, and a royal garrison. King John ordered the fortifications to be repaired; a stone wall was built; castles were erected at the north and south gates; and bridges were made with portcullises for maintaining communication with the little towns adjoining the abbeys that had been founded on the north, as well as on the south side of the river, and which are now the north and south suburbs. Cork, however, was not fo early a place of the first importance in the island. Stanhurff speaks of it as inferior to Limerick and Waterford; and Boate, who wrote near a century later, in the time of Cromwell, as inferior to the same towns, and Galway. Camden, who wrote in the time of Queen Elizabeth, thus describes it: "It is of an oval form, enclosed with walls, and encompassed with the channel of the river, which also crosses it, and is not accessible but by bridges lying along, as it were, in one direct street, with a bridge over it. It is a populous little trading town, and much reforted to; but is beset with rebel enemies on all sides, that they are obliged to keep constant watch, as if the town was continually besieged, and dare not marry out their daughters into the country, but contract one with another among themselves, whereby all the citizens are related in some degree or other." But though the town of Cork was confined to the small island now occupied by the main street and the numerous lanes which intersect it; yet the suburbs were considerable, and were protected by several castles.

The trade of Cork, in these periods, was not extensive, and the principal support of the inhabitants was the consumption of the monasteries, of which there were several. A haven, Kinlale was in greater estimation. Since the commencement of the 13th century, the town has been gradually enlarged, by taking in and building upon the several marshy islands which lay near the principal one. The channels which were between these, served the purpose of canals, and were convenient in some respects, by enabling the merchants to load and unload their vessels at their respective warehouses, which often joined their dwelling-houses. In this, it resembled a Dutch town, and such is the description given of it in "the Traveller's Guide through Ireland," published in 1806. It is now, however, more than twenty years since the plan was adopted, of filling up these canals; and there is at present (1807) not a single one in the city, which appears as one island, lying between the north and south branches of the river. By this means, there are several wide pleasant streets, which want only regularity in the buildings, to enable them to vie with those of the capital. The health of the city has also been promoted, for putrid exhalations arose from these canals, which were a receptacle for filth of all kinds; and, when the tide was out, had both a disagreeable smell and appearance. Many houses have been rebuilt, and in consequence of a new bridge thrown over the north channel, the city is increasing rapidly on the northern bank of the river. So long ago as 1788, the houses were 8003 in number; since which time, there has been a considerable increase. The number of inhabitants in several of the old houses is very great, in some cafes above 50; and from the account Dr. Whitehall has given of the population of Dublin, we may safely reckon ten to a house. We shall then be within bounds in stating the population of Cork at 80,000. It may serve to strengthen this opinion, that in the year 1801, when, in consequence Vol. IX.
mills, with large stores, at a place called Ballincollig, belonging to government. The public-market, nearly in the centre of the town, is very neat and convenient. The meat-market consists of three rows, on each side of which the butchers have stalls. The whole is well flagged, covered in, and lighted from above. Adjoining are the fish, poultry, and root markets. These markets are open, and supplied on every day, except Sunday; but on Wednesdays and Saturdays, which are reckoned market days, the supply is abundant, and of the best quality. There are some inferior markets, but they do not deserve notice. The county jail is a handsome new structure, built at a short distance from the city, which will enable the grand jury to take down the south gate at one end of the main street; on, and adjoining which, was the old county jail. As a new city jail is shortly to be erected, the north gate may also be taken down, which will be a material improvement to that part of the city. The bridewell is a plain building, suitable to its purpose. The county court-house has been lately new-modelled, and an elegant entrance to it built, so as to be more worthy of the extensive and opulent county, the benefits of which are transmitted there.

There are a great number of charitable institutions, but the buildings are not remarkable. Where the funds, indeed, depend on voluntary contributions, it cannot be expected that there should be money to expend on ornaments. If, however, they cannot be spoken of as contributing to the beauty of the city, they undoubtedly do honour to the feelings of the inhabitants. There are two infirmaries, containing upwards of 50 beds; a house of industry, with commodious cells for lunatics adjoining it; a house of recovery, for the reception of fever patients; a lying-in hospital; a foundling hospital, which receives about 200 children, besides those at nurse; a blue-coat hospital for 24 boys; a school of industry for 100 children of both sexes, with several almshouses and parish school-houses. There are, besides, a general dispensary, which is provided with every thing necessary for relieving the sick, and for lending small sums of money to poor tradesmen; a society for relieving persons confined for small debts, and for lending small sums of money to poor tradesmen; a society for relieving the poor, in time of sickness; and a society for assisting strangers, and enabling them to return to their respective homes. Except the foundling hospital, which is supported by a tax on coal; and the house of industry, which receives grants from the county and city grand juries; all of them chiefly depend on voluntary contributions, or on public amusements, which are made in a great degree conducive to charitable purposes. The consequent difficulty of procuring funds for their support, obliges the conductors of these institutions to use rigid economy; yet it may be questioned, whether the time now spent in providing necessaries might not be better employed in preventing the internal regulations; and whether a permanent support for every useful institution would not, on that account, be desirable. Cork has also a society for letting the condition and increasing the comforts of the poor, which maintains a correspondence with the similar societies in London and Dublin, and has suggested many useful plans, some of which are performed in with success. Though the citizens of Cork have been distinguished by some liberal travellers, as neglectful of the sciences and fine arts; yet there seems to be no just ground for this censure. The public library, supported by annual subscriptions, contains a large and well chosen collection of books, which is rapidly increasing. The institution already referred to, which also originated in private subscriptions, has a scientific library, a large collection of minerals, and the necessary apparatus for giving lectures in natural philosophy and chemistry. The managers of it, having received the countenance and support of government, are now adding a botanical garden, and extending their plan in many respects. The proprietors of the institution, with some other gentlemen, form a literary and philosophical society, which meets on two evenings in every month. With respect to the fine arts, music is a favourite amusement; and there are many excellent performers, both professors and amateurs. The highly celebrated Barry, who was a native of Cork, was first brought into notice by an ingenious townsmen, Dr. Keigh; and there are not wanting, at the present time, men who have talent to discern, and liberality to encourage, rising merit; though a place to remote from the capital cannot be expected to afford scope for eminent talents. The environs of Cork, towards Passage and Glanmire, are extremely beautiful: the lands rise in gentle hills, ornamented with many country houses, gardens, and plantations, and with woods and fields of variegated verdure. On an island between the two branches of the Lee, above the city, is a walk of an English mile in length, planted with trees; from which there is a pleasant view of part of the city, and of the suburb of Sunday's Well. It is called the Mardyke, and is a fashionable walk. But whatever advantages its environs may possess, or whatever improvements may take place in this city, the source of all must be sought in its safe and capacious harbour, which has now become a regular station for an admiral, and which is the place of rendezvous for fleets failing to the West Indies. The principal export from Cork has long been provisions, including beef, pork, and butter, made up either for the West Indies, or for the supply of the British fleet. The average exportation of beef, in the years 1743-1755, was 62,950 barrels; the average of butter, in the same years, was 84,105 cwt. and Smith says, it was ascertained that the average number of bullocks and cows slaughtered in Cork, from August to Christmas in each year, was near 100,000. The export of butter began about the year 1623; and about the same time the merchants began to barter up their beef and butter with hoops bound about with twigs, after the English manner; and at present they are also iron-hooped. The average of beef for 19 years, ending in 1773, had increased to 291,750 barrels; and that of butter to 120,000 cwt. The export of pork was at that time inconsiderable. The average value of the whole exports was 1,100,190l. sterling. The other articles of export were hides, bary and woollen yarn, cambrics, serges, candles, soap, tallow, herrings, glue, wool, and some small articles. Of late years, the export of beef, and of all the articles connected with it, has decreased; and that of yarn, cambrics, and serges, has almost entirely ceased: but the export of pickled pork and bacon, of corn, of porter, spirits, &c. has become considerable. The quantity of butter exported in 1806 was 160,000 cwt.; the number of black cattle, on the average of the three last years, was only 18,000; the number of calf-fkins, on an average of the same years, about 50,000. The imports are chiefly for the supply of the city, and the adjoining district. The breweries and distilleries of Cork are a great source of wealth. There are five porter breweries, besides many of ale and small beer. That distinguished by the name of the Cork porter brewery is the most extensive, not only in Cork, but in Ireland, and is probably surpassed only in London. There are four large distilleries, each of which pays 2100l. duty per week. At one of these is a steam-engine, of Boulton and Watt's latest construction: it is of 40 horse power, and no expense has been spared in the erection of it. The manufacture of clothing for the army is also very extensively carried on; and there are many kiler factories for coarse cloth, large, &c.

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The manufactories of sail-cloth, sheeting, paper, leather, glue, glass, &c. are also considerable. The corporation consists of a mayor, two sheriffs, a recorder, and several aldermen. The charter was given by Charles I. The sheriffs are chosen by the freemen at large; and, after having served the office, are called burgesses. On the day of election, the names of all these burgesses are put into a box or hat, and five names are drawn out: of these five the freemen are to choose one to be mayor for the ensuing year. By an agreement, however, which has been entered into by a great number of freemen, who form a club, the tenor burgesses, if willing to serve, is always elected. The same club has also assumed to itself the choice of sheriffs, so as to render the public election a mere farce, or rather a ratification, according to form, of what has been previously determined at a meeting of the club. Cork, as well as Dublin, retains the privilege of sending two members to the imperial parliament. The electors consist of about 1500 freemen, and a number of freemen in the county of the city, which is very extensive. The eldest sons of freemen are entitled to their freedom, as well as those who serve a regular apprenticeship to freemen. Many also obtain this privilege by favour every year; for as the number of voters is too great to admit of any attempt to dictate to them at elections, so there is little inducement to throw difficulties in the way of obtaining freedom. The income of the corporation, which arises chiefly from duties paid by those not free on articles of trade brought into the city, is so small as to be scarcely sufficient for the current expenses. In history Cork has not been remarkable. Like most other parts of Ireland, it engaged in the interest of the impotors, Perkins Warbeck, which brought the citizens into some difficulty. In 1690 it was besieged by King William's forces, under the earl (afterwards duke) of Marlborough, and taken after a short resistance. The duke of Grafton, a natural son of Charles II., was killed at this siege.

Cork is 126 Irish miles S.W. from Dublin. The latitude of the observatory of the Cork Institution is 51° 53' 54" N. Longitude W. from Greenwich, in time, 33° 50'; in degrees, 8° 29'. Smith, Young, &c. &c.

Cork, Bishopsrick of, is supposed to have been founded in the fourth century. It was united with Rosc by queen Elizabeth, in 1586; and they are both contained in the county of Cork, as is also the adjoining one of Clare. The Union is, in Irish miles, about 65 by 17; and in English, 83 by 23. The number of acres is 480,300, which are divided into 127 parishes, of which only 54 have churches: Beaufort.

Cork-bay, a bay on the east side of Newfoundland island.

Cork, or Corking of a fiddle, are pieces of wood upon which the bootles are made fast.

This part of the fiddle was formerly made of cork, whence it still retains the name.

CORKAY, in Geography, a small town of France, in the department of the Côtes du Nord; is the chief place of a canton, in the district of Loundéc. The town contains 1483, and the canton 6481, inhabitants, dispersed in five communes, upon a territorial extent of 117½ kilometres.

CORLI, in Ornithology, the name given by Albinus to the Scopolarix tetanus, the spotted red-flank of Pennant, and spotted faipe of Latham.

CORKIN, in Geography, a small town of Prussian Pomernia, on the river Parnice; 12 miles S.E. of Cölberg. It has a few woollen manufactures.

CORLIS, in Ornithology, the common curlew, or Scolopax rusticus.
COROMOLAIN, in Geography, a town of France, in the department of the Calvados; 10 miles S.S.W. of Barneux.

CORMONS, a town of Germany, in the county of Goritz; 7 miles S.W. of Goritz.

CORMONANT, in Ornithology. See Pelecanus carbo, and Corvus aquaticus.

CORMOS, or CORMON, in Ancient Geography, a town of Arcadia, on the frontier of Lacania, near the source of the river Careianus, S.E. of Megalopolis. In the time of Pausanias, its ruins only were to be seen.

CORN, in Agriculture, a term applied to all sorts of grain fit for food; particularly wheat, rye, &c. The farmers, indeed, reckon under the denomination of corn several other grains; as barley, oats, and even pulse; as peas, vetches, &c., which, however, they sometimes distinguish by the denomination, fooler corn.

Europe, in every part of it; Egypt, and some other counties of Africa, particularly the coasts of Barbary, and some parts of America, cultivated by the Europeans, and the Armenians themselves, produce corn. Other countries have maize and rice, in lieu of it, and some parts of America, both in the islands and continents, simple roots, such as potatoes, and manioc.

Egypt was anciently the most fertile of all countries in corn; as appears both from sacred and profane history. It furnished a good part of the people subject to the Roman empire, and was called the storehouse of Rome and Italy. England, France, and Poland, seem now to have supplied the place of Egypt, and with their superfluities support a good part of Europe.

For the first discovery and culture of corn, authors are much divided: the common opinion is, that in the first ages men lived on the spontaneous fruits of the earth; as acorns, and the nut, or mall, produced by the beech; which, they say, took its name, linnus, from the Greek ἕλιον, I eat. It is added, that they had not either the use of corn, nor the art of preparing, or making it eatable. See Baking.

Ceres has the credit of being the first that shewed the use of corn, on which account she was placed among the gods; others give the honour to Triptolemus; others share it between the two, making Ceres the first discoverer, and Triptolemus the first planter and cultivator of corn.

Diodorus Siculus ascribes the whole to Isis; in which Polydore Virgil oberves, he does not differ from the rest; Isis and Ceres being, in reality, the same. The Athenians pretend, it was among them the art began; and the Cretoans, or Candiaots, Sicilians, and Egyptians, lay claim to the same. Some think the title of the Sicilians best supported, that being the country of Ceres; and authors add, she did not teach the secret to the Athenians, till she had first instructed her own countrymen. Others say, Ceres passed first into Attica, thence into Crete, and, last of all, into Sicily; many of the learned, however, maintain, it was in Egypt the art of cultivating corn first began; and it is certain, there was corn in Egypt and the East, long before the time of Ceres. For the various modes of producing corn, and preparing it for use; see Husbandry; and other articles appropriate to each kind of grain in this dictionary.

For the best method of preferring corn, see Granary.

Corn Laws, in Rural and Commercial Economy, are those laws and regulations which relate to the importation and exportation, as well as general trade in grain. They are a set of rules and regulations which have undergone much change and alteration at different periods, but which still seem far from having attained that degree of perfection which is essential in so important an article of commerce. It has been remarked by an able writer, that "almost every other manufacture may be admitted to a free trade; but as the trade of corn must at all times be limited by, and subservient to, the necessities of the state, it requires the attention of a careful and fostering parent."

It is therefore contended, that the agriculture of the nation "ought to be guarded by the wise and the strictest execution of them, as the only certain means of employing the greatest number of people, and consequent on increasing the population; and that it is the better entitled to this attention, that the farmer and the landholder pay a full proportion of all taxes imposed for promoting and protecting the fate of our other manufactures, both at home and abroad, as well as for the growth of corn alone.

Though very different principles have been laid down as the basis of these laws at different times, it seems evident that, as the strength and power of a nation must be proportioned to the extent and industry of its population, the chief attention of the framers of them should be directed to such measures as have an immediate tendency to encourage and promote the improvement of agriculture. It has indeed been contended, on the ground of long experience, that the foundation of such regulations should always be such as is calculated to induce the inhabitants to improve their grounds in such a manner as to raise the largest proportion of grain, the particular soil and climate is capable of permitting. And that this is "an object which can only be attained by securing a certain and steady market to the farmer for his produce; not only by preventing importation, but also, whenever it shall appear, from the moderate price of grain at home, that a greater quantity has been raised than is required for the annual supply of the inhabitants, by giving such a bounty on exportation, as shall ensure a ready vent for the excrecent flock in foreign countries. It is not enough, says the able writer, that a nation raises, in general, a sufficiency of corn for the consumption of its inhabitants: it must be accustomed to raise considerably more, in order to afford plenty in bad years; and its annals ought to be distinguished by a greater or lesser exportation; but on no occasion ought it to be reduced to the necessity of importation, and having recourse to foreign countries for an expensive and precarious relief."

Mr. Young in his "Political Arithmetic" likewise remarks, in speaking of the obstacles which bad corn laws threw in the way of good husbandry, and of the want of permission to export grain in Spain, Portugal, and some parts of Italy, that he does not conceive it possible, "under such a system, to have a flourishing corn husbandry—prices will be too fluctuating—some years will be so cheap that the farmers will be ruined, and others so dear that the people will be starved. Long experience must convince us, continues he, that this is not only reasoning but fact. Famines never appear in countries that admit a free exportation; but in all above named, where a contrary policy has been pursued, they have appeared frequently and severely." And he farther observes that "the variations in the earth's produce, owing to faticans, though not so great as some have imagined, where the husbandry is good, just where it is indifferent, must necessarily be considerable." He thinks that one maxim may be laid down on this subject which can hardly be contradicted, which is, that "the good of husbandry requires that the price of corn should be proportioned to the product. Let us then add, supposing the common consumption of a nation to be 5,000,000 of quarters of bread corn: the proportion between the consumption and the annual consumption must vibrate according to various circumstances. Suppose a crop, of 6,000,000 of quarters, and no exportation, what
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what, he asks, must be the consequence? There is the surplus of a sixth in the markets, consequently the price is brought down much lower than that proportion. Here, says he, lies the misfortune. If corn in such a year yielded a price proportioned only to the plenty, the misfortune would not be great; but the addition in the markets of a sixth sinks the price probably a third, and perhaps more. And further, supposing "another good crop, with a new surplus of a sixth or seventh; this coming upon granaries full of a part of the former surplus, sinks the price yet lower; and then the farmers are not only discouraged, as, he says, several writers have observed, from sowing another crop, but what is as bad, they are impoverished so much that they cannot plough, harrow, dung, drain, ditch, fence, or do any thing with proper spirit. These two circumstances, inability in future to act well, and discouragement from sowing again, can hardly fail, he thinks, of occasioning in future years a scarcity, or probably a famine. Then the farmers resp of course a thin crop, from their former inability, and that too over only part of the land usually tilled; in such a cafe, corn, he contends, must be very high to recompose the farmer; probably so high, that the government of the country is alarmed, and imports corn from wherever they can get it; then the price falls, when he again fullers. Thus a great crop or a bad one operates equally against him, and nothing can support him at all but such a product, as pretty exactly answers the annual consumption. There is no balance preferred in the measures, exportation is prohibited, yet importation is allowed; so that it is impossible the price should with any regularity be such as can encourage good husbandry."

"On the contrary, if the policy of the state admits exportation, the surplus of a large crop being sent away, keeps the price at home, he maintains, from falling too low; this is an encouragement to the farmer acting two ways; first, by enriching him, he is able the better to improve all his culture; secondly, he is induced to sow as much corn as possible, for every man, whatever be his trade, is desirous of increasing that commodity which sells best at market."

The bounty on exportation, which was formerly given in this country, is considered as a refinement on this policy, and which, though given originally with the view of raising the price of grain, as an encouragement to the country gentlemen, yet it had the contrary effect, having rendered corn much more cheap, by becoming so great an inducement to the cultivation of it.

It is, in short, strongly contended, that "in such countries as will adhere to so destructive a system as that of restraining the export of corn, it is not of much consequence whatever advantages are given to husbandry, since all others united, that can be named, or thought of, will not make amends to the farmer for the want of a market: it is of no consequence to enable him to raise noble crops, if when he has got them, he cannot sell at a proper price; his plentiful harvests tend only to his ruin." From the fullest consideration of the subject in various points of view, an able writer conceives it obvious, "that agriculture and manufactures are established on very different principles, and that whilst wealth and population raise considerably the money price of corn, and other rude produce of the soil, they have not an equal effect in advancing the price of manufactures." Hence, contrary to the opinion of the celebrated author of the Wealth of Nations, it is supposed the following political maxim may be fairly deduced: "that agriculture in rich and populous countries, stands more in need of a monopoly for its support than manufactures; and that the farther a nation advances in prosperity, it becomes the more necessary to secure its agriculture, not only by restraining the importation of foreign corn, but also by removing every impediment which may prevent, and by giving every encouragement which may promote, the extension of cultivation and improvement over the whole face of the country."

Consequently, that, if this country with "to preserve her present superiority in wealth and resources over the surrounding nations, agriculture must be protected by allowing to the husbandmen prices for their produce proportioned to the internal wealth and prosperity of the country; and that, if at any time, the bringing in of foreign corn tends to sink the money price of British grain below the corresponding value of labour and other commodities, the importation must be checked by judicious laws, altered from time to time, at different periods, to correspond with the prosperous or declining state of the country."

The principles on which the corn laws have been constructed at different times, so far as they can be traced and recognized, appear to have been these.

1. That of cutting off the importation of corn from foreign countries, except when the price at home was very high.

2d. That of granting a bounty on the exportation of it, when it does not exceed certain prices.

3d. That of having recourse to both these measures according to circumstances; or what may be termed a fort of mixed or shifting policy, without any thing being permanent, without any regular law, or due arrangements of prices at which export should be allowed, or import be prohibited.

4th. That of lowering the import rates and duties, as well as that of the bounty, on exportation in a considerable degree, in order to reduce the prices of corn in the home market, to the state of former periods, and thus to introduce a permanent law in respect to corn by which the inconveniences of a varying policy may be remedied. And,

Lastly, That of regulating the import and export of corn, and the bounties and duties upon them, by the particular circumstances of the period, so that the farmer may obtain a fair and reasonable profit in the home market.

Having now considered the different objects which should be particularly attended to in constructing laws for the regulation of the commerce in grain, and shewn the principles on which they seem to have been in general founded, it may not be improper to trace thecauses from which they proceeded, and the effects which they have produced at different times.

In regard to the corn laws of this country, as they existed previous to the revolution in 1688, it may be observed, that in order to "preserve the laws of the kingdom in force, it was considered necessary, for several centuries after the conquest, to renew or confirm them upon the accentions of new soveraigns, a practice which explains the reason of the various confirmations of the great charter, and the frequent re-enactments of the same laws, on this subject, as well as others, without any new meaning appearing on the statute-book."

At this period, the rents of lands, held by farmers or tenants, were for the most part payable in produce, as in corn, cattle, or some other product afforded by the soil. And the rules by which the rents were received were extremely indefinite and irregular; the measures of grain being various, and taken heaped, nine bushels generally constituting the quarter. For though by the great charters of king John and Henry III., which had been often confirmed by succeeding kings and their parliaments, one weight and
and measure had been directed to be made use of over all England, yet it was far from being the case, as is shown by an act of 1360, the 25th of Edward III., in which the weights and measures are again attempted to be regulated; and in which it is directed, that eight bushels sliver and no more, shall be received as the quarter of grain, "but faving the rents and farms, and all manner of franchises of the lords."

On which Mr. Dirom remarks, that, "with such refractions, it is not to be expected that the law could have any effect." And he adds, that, "under such impositions with the opprobrium of purveyance, and the depressed situation in life wherein the farmers were placed, it is not to be wondered that agriculture languished, and that a numerous community depended upon foreign provisions for their subsistence."

In tracing the progressive advances of agriculture from this depressed situation, it may be necessary to observe, that, at these periods, most of the business of the dealer or trader was carried on in the different markets and fairs of the kingdom, and that a large proportion of the revenue of the crown was drawn from the duties payable to the king, on the goods brought to them in order to be sold. And the barons had likewise, within their respective jurisdictions, tolls at the fairs. Hence it not unfrequently happened, that as the farmers and other dealers were conveying their corn and other necessaries to the markets and fairs to be disposed of, they were met by perons on the road, in order to purchase them for the purpose of retailing them at a higher price, in consequence of which, the king and the lords of the manors were deprived of the different duties payable upon them, and at the same time the price was enhanced on the people, in consequence of the diminished quantity brought to market. It of course became necessary, both on the score of public and private interest, to prevent the practice as much as possible, by the infliction of severe penalties; and various laws were enacted for the purpose at different times, the offenders being termed forellers, regators, and ingroffers.

Hitherto, as various laws had been formed with the view of inviting the importation of foreign articles of necessity, while the exportation of the superabundant flock of British grain had been prohibited, it cannot be supposod that agriculture had been encouraged as an object of national importance. About this period, 1393, however, a law was made, the 17th Richard II. c. 7, which authorized all the king's subjects to carry corn out of the kingdom, upon the payment of the customs and subsidies. And which was confirmed in 1425, referring to the king and council, power to restrain the exportation when they should judge it necessary.

However, from this reservation being confirmed into a prohibition to export grain without a licence, or from the difficulty of procuring the licence, the beneficial con-sequences to be derived from it were prevented; and from the check which was thus given to the art of cultivation, much inconvenience and diftrefs experienced in the country, as is fully shown by the preamble to the law of 1436, the 15th Henry VI. c. 2, by which it was followed, and in which liberty was given to perons to transport grain, without a licence to wherever they chose, except to the enemies of the king, when wheat was at 6s. and 8d. and barley at 5s. the quarter; which were fums rather above the medium prices, being in the proportion of the present money of 2l. 4s. for the quarter of the former, and 19s. 10d. for that of the latter.

The advantage of this law had been found so beneficial to the country in restoring abundance of grain, that it was in 1442 and 1444, confirmed and continued for ten year as well as soon afterwards made perpetual, by the acts of 20 Henry VI. c. 6, and 23 Henry VI. c. 5: and the effects of which, so far as they can now be discerned, were those of a very moderate and more steady, or less fluctuating, price of corn for forty years.

However, notwithstanding this, the laws favouring the importation of foreign grain still continued in force; and the trade was in the hands of foreign merchants or dealers, who conveyed their corn or other articles from one port to another, so as to anticipate the English farmers in the sale and disposal of their grain or other produce. And it is suggested by Mr. Dirom in his "Inquiry into the Corn Laws and Corn Trade," that "although those merchants may have loft upon the grain which they imported into England at this time, they gained upon the general course of the trade; because they received in return, wool, unfinished woollen cloth, and ready money, upon which they made great profit in their own countries, and thus were enabled to underfet the produce of our fields at home."

Further, "this appears to have been the case, even after this period, from two restrictive and regulating laws of Richard III. 1, c. 8, 13, by the lal of which it appears, that the foreign merchants who imported wines into England, had not only taken their payment two-thirds in woollen cloth, and one-third in ready money, but had considerably lefsered the contents of their wine casks, although fold under the former titles and contents."

The inconvenience and consequent diftress to which the business of cultivation was exposed, by the conftant importation of foreign grain, at length awakened the attention of the legislature, and in 1463, a preventive law was made, 3 Edward IV. c. 2; some of the caufes of which feem to have been, that the labourers or cultivators and occupiers of land, had been grievously injured by the importation of foreign grain, when corn at home was at a low price; by which the importation of foreign grain was prohibited, until the prices at home should exceed 6s. 8d. the quarter for wheat, 4s. for rye, and 3s. for barley; which is in the proportion of 1l. 15s. 2d. 1l. 1s. and 15s. 10d. of the present money.

The able author quoted above, considers thee as the laws to which the agriculture of this country owes its origin; and that notwithstanding their object have frequently been defeated by others, they are the basis or foundation which will remain; and on which a great fabric, now out of repair, has been erected; but which, by "moderate attention, may long continue to be the chief ornament and support" of the kingdom. It was on these laws, he adds, that the agriculture of the country refted for nearly a century; though the want of their being duly executed, rendered them in a considerable degree nugatory. For as the prohibition of the importation of foreign grain, was never sufficiently regarded; the occupiers of land had still to contend with the competition of grain from abroad as well as other oppressions and grievances at home; as is fully shown by an act made in the year 1552 against regators, forellers, and ingroffers, the 5 ar d of Edw. VI. c. 14; "by which the crime of forellalling is extended to perons buying victuals coming in ships from beyond the seas, to be sold in any market or fair, city, port, haven, creek, or road, as if no laws had been enacted by which such importation had been prohibited." And after observing that although the "repression of the practices of forellallling and regating might have been neceffary," it is not easy to discover any caufe "for the enactment of ingroffing" at a period so late as this when commerce had made such considerable advances; and further that, "by the same law, no peron
per son at home could transport corn from one port to an- 
other without a licence; neither could they purchase corn 
to be laid up in their granaries for home sale, until the 
quar ter of wheat was at, or under, 6s. 8d. (equal to 10s. 6d. 
of present money): malt and barley at 3s. 4d. (8s. 3d.); 
oats at 2s. 4½d.; peas and beans at 4s. (9s. 11d.); and 
rye at 5s. (12s. 5d.) per quarter.*

By these means it is contended that the former system of 
corn laws was wholly subverted, for that, "although these 
were the prices to which exportation was limited by the act 
of Edward IV. in 1463, the value of money was materially 
changed; for, at the former period, there were only 57s. 
6d. in the pound of silver, and now there were 60s. 4d. and at 
the former period, money bore a very high and unlimited 
interest, and now, it yielded only about 12 per cent. per annum; 
so that 6s. 8d. for a quarter of wheat, in 1463, was equal to 
1l. 15s. 2d. and in the year 1552, it was only equal to 
16s. 6d." as has been noticed above. And further that the 
prohibition to the purchasing of grain for storing up or con-
veying coast-ways, till the price should sink beneath the ex-
istence of raising it, must have necessarily put a total stop to 
all dealings in grain and of course ruin the farmers; all of 
which was done at a period when the price of corn had been 
invariably at a low rate. It is supposed not to have oc-
curred to the legislature at this period, that by keeping 
the grain at home in feasons of great plenty the price must be 
steadfastly enhanced, as the farmers would not be capable of continuing 
their trade of raising grain under such disadvantageous cir-
cumstances; of course, that as soon as the stock on hand 
was consumed, scarcity if not famine must be the con-
sequence; nor that by permitting an exportation of the ex-
creant stock, plenty would be ensured, by preferring an 
open market to the farmers, and in that way enabling them to 
carry on their business, and raise more grain than was in 
general necessary for the home consumption; nor was the 
benefit that would arise to the nation, from the increased 
number of persons who might be engaged in raising and ex-
porting the quantity of corn that could be spared, or the 
sums of money which would be brought into the country as 
the price of it, in the least attended to.

It seemed to have proceeded on the idea that the only 
mode of preferring plenty, was that of keeping the whole 
of the corn and other provisions at home, and importing as 
much as possible from abroad, which appears from experi-
ence to be far from having any foundation in truth.

However, the same system was farther enforced and 
followed out by the enacting of another law this year 1554. 
1 & 2 Phill. & Mary, c. 5. under the imposition of injury 
from the exportation of corn and other victuals; by which 
it was provided that "no manner of person or persons should 
export any wheat, rye, barley, or other sort of grain, grow-
ing within England; or any malt made within the same; or 
any butter, cheese, herring, or wood, without having licence 
fo to do, under severe penalties; except when the common 
price of corn, within England, should not exceed for wheat 
6s. 8d. (equal to 10s. 6d. of present money): rye 4s. (9s. 
11d.) and barley 3s. 4½d. (7s. 5d.) per quarter.*

Such was the policy of Edward IV. as well as of Philip 
and Mary, notwithstanding the price of wheat this and several 
years before, had been only 8s. the quarter (equal to 19s. 
10d. of present money); and the export prices below the 
medium ones in times of ordinary plenty; and in Scotland 
it was soon afterwards followed by laws expressly prohibitory 
under very severe penalties of the exportation of all sorts of 
victuals, tallow, and fleeth. Mary par. 6. c. 40. Jaa. par. 11. 
c. 55.

After the enacting of this law, from the seafsons being 
favourable and the importation of foreign grain being con-
tinued, the price of wheat remained about 8s. the 
quarter; the farmers became ruined, and the businessmen 
of cultivation much relinquished; which strongly marks the 
aburdity of directing persons to labour in occupations in 
which they cannot procure a reasonable subsistence. The ex-
cellent laws of Henry VI. and Edw. IV. had continued with-
out respite throughout the reigns of Henry VII. and VIII. 
without, however, being countenanced or having any execu-
tion, yet these sovereigns, as well as Edw. VI. and Philip 
and Mary, made repeated laws to enforce the people to 
cultivate and flow their grounds, 4 Hen. VII. c. 19. 7 Hen. 
VIII. c. 27. Hen. VIIII. c. 22; 3 and 6 Edw. VI. c. 15. 
2 and 3 Phill. and Mary c. 2. thofe of the latter being parti-
cularly prejudicial in repressing the spirit of husbandry.

Thefe inconsistencies did not however escape the attention 
of Elizabith, as almost immediately upon her accession she 
not only renewed the laws which formerly existed for rebuilding 
farm houses, and tilling the land formerly in cultivation with greater vigour, 5 Eliz. c. 2. but by another law 5 Eliz. 
c. 5. § 26. permitted farmers to export their corn as merchant-
dize, when the price was not high at home, as when wheat 
did not exceed 10s. the quarter, equal to 1l. 8s. of present 
money, rye, peas or beans, 8s. (16s. 7d.) barley and malt 
6s. 8d. (13s. 10d.) And as in the former of these laws, 
the penalties had been given to the king, they were now 
given to the next heir, &c. of the person offending. By this 
means a considerable extenion of the exportation prices took 
place, which is remarked by the bent writers of that period 
to have had a direct and immediate effect in the increase of 
tillage and the reduction of importation, though it had been 
observed by one of them that for several years preceding that 
time, "the importation of grain had exceeded forty-five 
millions of livres." Thofe are probably the first traces of the 
navigation laws.

Not long after this, in 1570, a still more rigorous effort 
was made to restore the agriculture of the country, in a law 
enacted for the better increase of tillage, &c. 13 Eliz. c. 13. 
by which exportation was permitted, without limitation of 
prices, from such ports and creeks, in which a customer or 
collector of the subsidy of tonnage and poundage, had been 
placed, to any part beyond the seas in amity with England, 
when not restrained by proclamation, provided such exporta-
tions were made in ships belonging to English born subjects 
refiding within the dominions; at such times as the several 
prices of grain should be so reasonable and moderate, when 
such exportations were intended, as that no prohibition 
should be made by the queen's proclamation, or by the 
presidents of the North, or of Wales, within their several 
juridictions; or of the justices of assize at their seessions, 
in other threes out of the jurisdiction of the said two presidents 
and councils; or by the major part of the justices of peace 
of the county at their seassions. Thus, thefe different 
magistrates were to annually confer and deliberate with 
the inhabitants of the county concerning the prices of the 
different sorts of corn within their juridictions, in regard to 
it's cheapness or dearth, and by their discretion decide 
whether it would be meet, at any time, to prevent any grain 
from being carried out of the realm, by any port within their 
juridictions or limits, and by a writing under their hands 
and seals, make a determination, either for permission or 
prohibition, and cause the same to be published by the 
sheriffs of the several counties; which was to continue in 
force until the same should be altered, by the said pre-
sidents and councils, or other powers respectively, except 
the same should, in the mean time, be countermanded by 
the queen, her heirs or successors; or by some order of the 
justices
judges of peace, in the counties situated out of the jurisdiction of the said two counties, in their quarter sessions to be held in the mean time, or the greatest part of them, should have the determination of the justices of assize to be hurtful to the country, in consequence of the dearth, or a great hindrance to tillage, in consequence of the great cheepness; which determination was in like manner to be published, and continued in force until a new regulation should be made; except the same should in the mean time be altered by the queen, her heirs or successors: provided always, that these precedents, &c., should not publish their determinations, until the same was first notified to, and approved by, the queen, or her privy council: and that the custom or poundage be paid upon exportation: provided likewise, that the queen, her heirs and successors, might at all times by proclamation, prohibit exportation, either generally from all the parts of the realm, or particular parts only.

Mr. Dirom supposes the corn trade, in this case, to have been considered in a scientific manner; and that if the plan marked out had been properly digested and modified, as well as the duties upon exportation removed, there could have been no doubt of the act producing the most beneficial consequences to the kingdom; but the judges, to whom this important business was intrusted, had no certain rule by which to direct their proceedings, not being permitted to determine, by the price of grain at the time of their annual inquiry, the only certain index of plenty or deficiency, but simply upon a conference with the people of the country, to decide whether it would be hurtful to the kingdom, from the dearth, or a great hindrance to tillage, from the too great cheepness, to admit the exportation of corn, than which, he thinks, nothing could be more vague and uncertain. But further that, "whatever consideration might have been given to the framing of this act, the laying a duty of twenty per cent. ad valorem upon grain to be exported by licence, and ten per cent. upon grain to be exported by the statute, was equal to prohibition, and gave full scope to the importation of foreign grain, which was still (he says) received without the payment of any duty."

However, "in Scotland, the prohibition to export grain to foreign parts was continued under severer penalties," as by Jas. 6. par. 11. c. 55.

Judging concerning the effects of the preceding law of England, from the prices of grain immediately subsequent to it; they do not seem to have been favourable, as the price of the quarter of wheat in 1574 was 2l. 16s. equal to 5l. 15s. 8d. of present money; and in 1597 not lower than 3l. 4s. equal to 6l. 12s. 8d.

In 1593, the corn laws seem to have again undergone a fort of revision, though the reason is not by any means explained; but they are taken notice of in an act, the 35 Eliz. c. 7, made for the adjusting of other acts, and which is entitled, "An Act for reviving, continuance, explanation, and perfecting of divers Statutes," by which it would seem, that the absurd and impracticable scheme of forcing the people to labour or cultivate their land, whether they could live by such means or not, had been given up; as the act passed in the 5th of the present reign was now repealed, and the plan laid down by that of the 13th appears likewise, from other circumstances, to have been relinquished, though the act itself is neither mentioned nor repealed, as the resolutions of the legislature are found to be changed by the 23d section of the present act: by which exportation was permitted, when wheat was at 20s. the quarter (equal to 2l. 1s. 4d. of present money); rye, peas, & beans, at 13s. 4d. (1l. 7s. 8d.); and barley and malt at 12s. (1l. 4s. 10d.); which are exactly double the prices at which exportation was permitted by the former law of the 5th. However, at the same time, the duties payable upon corn, exported by force of the statute, were doubled; which, together with an unlimited importation, without the payment of any duty whatever, amounted to a prohibition, and consequently rendered the act nugatory, keeping the price of grain at an extravagant height; as, in 1594, the quarter of wheat sold at 2l. 16s., equal to 5l. 15s. 8d.; in 1595, at 2l. 13s. 4d., equal to 5l. 10s. 2d.; in 1596, at 4l., equal to 8l. 15s. 4d.; and in 1597, at 4l. 12s., equal to 9l. 10s. of present money.

The laws concerning grain continued, however, in this situation till 1604, when, on the accession of James I. to the crown, various statutes were revived; some continued, and others repealed, without any specific reason being given; and one was enacted in respect to grain, the 2 Ja. I. c. 25. § 26. 27. by which the exportation prices were considerably increased; namely, when the quarter of wheat was at 26s. 8d. (equal to 2l. 13s. 4d. of present money); the quarter of rye, peas, and beans, 15s. (1l. 10s.); the quarter of barley and malt, 14s. (1l. 8s.); provided the grain was carried abroad in ships belonging to English born subjects; referring to the king, his heirs, and successors, the power to restrain, by proclamation, the exportation from the realm in general, or from particular places. But from exportation being full, under this act, encumbered with duties, it is obvious that the complete operation of it must have been greatly retarded or prevented.

And in another reviving act of the same reign, 21 Ja. I. c. 28. § 3. 4. in the sections relating to grain, the exportation prices were still further extended, under similar terms with the former act; namely, the quarter of wheat at 32s., the quarter of rye at 20s., the quarter of peas and beans at 16s., and the quarter of barley and malt at 16s., of current English money. This extent of 32s. for wheat was equal to 3l. 4s. of present money; 20s. for rye, to 2l.; and 16s. for barley and malt, peas and beans, to 1l. 12s.: which different sums are nearly double the medium prices of the present time, consequently very great, having obviously the extension of revenue in view. Besides this, the penalties for ingrossing were obviated by this act, while the prices of grain did not exceed those stated in it, which was become essentially necessary, in order to restore the internal as well as external trade in corn, which they had nearly kept up a flnop to.

But the duties upon exportation having still been kept up, the proper effects of the law could not be produced.

In 1627, not long after the accession of Charles I., it was again renewed in exactly the fame terms. 3 Cha. I. c. 5. § 24. 25. It is, however, remarked by Mr. Dirom, that "although the export prices were literally the same, they were very different in fact; for, in the year 1624, the yearly interest of money having been reduced from 10 to 8 per cent., 32s. for a quarter of wheat, which, in 1623, was equal to 3l. 4s., was, in 1627, equal to only 2l. 11s. 2d. of present money," and so in proportion, in respect to the prices of other grain. It is conceived that the long interval of parliament, after the feSSION in which this act passed, and the confusion which quickly succeeded the proceeding of the following parliament, in 1640, were probably the causes of no farther attention having been had to the business during the remainder of the reign.

Though, from the unfortunate circumstance of connecting the corn laws with the revenue, the excellent inquisitions of the reign of Elizabeth, and those of her two immediate succe:sors, had in a great degree been frustrated, agriculture had, in other respects, been treated by the laws as an object of much importance; not merely in the view of the numbers employed
employed in it, or the intrinsic value of the produce which it afforded, but likewise in consequence of the support which would be given to the navy, from the export trade, arising from it. On the reformation of Charles II., however, it was inconsiderately abandoned, being treated merely as an object of revenue.

In the year 1660, without the least reason being stated for any alteration in the corn laws, in a fiction of the act of tonnage and poundage, 12 Ch. 11. c. 4. § 11, corn is considered in the same list or roll with other articles, on which duties are made payable. The exportation prices of grain were still more extended; but the duties were raised so high, as to be equal to a prohibition. Importation was also permitted; but the duties here likewise operated as a prohibition. The prices set for the exportation of wheat being 40s., equal to 2l. 8s. of present money; 23s. for the quarter of rye, peafe, and beans, equal to 1l. 6s. 10d.; 20s. for the quarter of barley and malt, equal to 1l. 4s. 1d. and 16s. for the quarter of oats, equal to 16s. 2d. And further by this act, the duties payable on exportation were 20s. for the quarter of wheat, equal to 1l. 4s.; 10s. for the quarter of rye, peafe, beans, barley, malt, and buck wheat, equal to 1l. 2s.; and 6s. 8d. for the quarter of oats, equal to 8s. And by the same act, the rates inward, on duties on importation, were thus regulated: for the quarter of wheat, when the price, at the place of importation, did not exceed 4l., equal to 2l. 10s. 10d., the sum of 2l., equal to 2l. 8s.; and when it exceeded that price, 6s. 8d., equal to 8s. of present money. For the quarter of rye, when not exceeding in price as above, 36s., equal to 2l. 3s. 2d., the sum of 1l. 6s. 8d., equal to 1l. 12s.; and when it exceeded that price, 5s., equal to 6s. of present money. For the quarter of peafe, beans, barley, and malt, not exceeding in price as above, 1l. 6s. 8d., equal to 1l. 12s., the sum of 1l. 6s. 8d., equal to 1l. 12s.; and when it exceeded that price, 5s., equal to 6s. of present money. Consequently, Mr. Dirom observes, that until the price of wheat for quarter was higher than 2l. 12s. 10d. of present money, and that of other grain in proportion, from the importation high duties acting as a prohibition, and exportation, being in fact prohibited, prices would quickly rise, and bring the country to import at the low duties; a circumstance which, he says, accordingly happened: "for, in 1660, the quarter of wheat sold at 2l. 16s. 6d., equal to 3l. 7s. 6d. of present money;" "in 1661, it rose to 3l. 10s., equal to 4l. 4s. 1d.; and in 1662, to 3l. 14s., equal to 4l. 8s. 10d. of present money." He adds, that these laws, in addition to their having raised the price of grain to an "extravagant height, had ruined many of the farmers," and that agriculture declined, a great part of the lands lying without tillage or cultivation.

In consequence of this, the corn laws were again taken into consideration in 1663, the preamble to the act concerning which, 15 Ch. 11. c. 5. § 1, 2, 3, 4, sufficiently shews the deplorable state into which husbandry had fallen; and it would seem that the legislature was now seriously anxious to afford it encouragement. By this law, the exportation prices were extended beyond their former limits: that of the quarter of wheat being fixed at 43s., equal to 2l. 17s. 7d. of present money; the quarter of buck wheat, barley, or malt, 28s., equal to 1l. 13s. 7d.; the quarter of oats, 17s. 4d., equal to 16s.; the quarter of rye, peafe, and beans, 32s., equal to 1l. 18s. 5d. current English money: but the exported grain being still suffered to continue loaded with nearly 50 per cent. of duties, it operated as a prohibition.

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paffed, entitled, "An Act for Improvement of Tillage, and the Breed of Cattle, for the common Good and Welfare of the Kingdom," it was enacted as lawful for every person, native or foreigner, to transport, at any time, as merchantize, all sorts of corn, although the prices exceeded the rates in the act of the 15th of the present reign; paying for the same the rates expressed in the act of tonnage and poundage. And that in cases where the prices of grain, at the places of importation, should not exceed the rates, as follows; there should be paid for custom these rates, namely, for every quarter of wheat, when the same should not exceed 53s. 4d., equal to 5l. 4s. of present money, the sum of 16s., equal to 1g. 2d.; when the same should exceed 53s. 4d., and not exceed 4l., equal to 4l. 16s., there should be paid 8s., equal to 9s. 7d.; for every quarter of rye, when the same did not exceed 40l., equal to 2l. 8s., the sum of 16s., equal to 1g. 2d.; for every quarter of barley, malt, or buck wheat, when the same did not exceed 32s., equal to 1l. 8s. 5d., the sum of 16s., equal to 1g. 2d.; and for every quarter of oats, when the same did not exceed 16s., equal to 1g. 2d., the sum of 5s. 4d., equal to 6s. 5d., and for every quarter of pease and beans, when the same did not exceed 40l., equal to 2l. 8s., the sum of 16s., equal to 1g. 2d. And that when the prices of corn should exceed the aforesaid rates, there should be paid the former custom and poundage: imagined to have been intended to be, by the act of 1663; 5s. 4d., equal to 6s. 5d., for wheat; 4s. 10d., equal to 4s. 10d., for rye, pease, and beans; 2s. 8d., equal to 3s. 2d., for barley and malt; and 1s. 4d., equal to 1s. 6d., for oats. 2 Charles II. c. 13. § 1. 2.

The above mentioned writer supposes that this law was without doubt designed to promote the exportation of English corn, and to restrain, if not prohibit, the importation of grain from abroad; but that the former was completely prevented, from the high duties continued upon it; and that the latter was rendered nugatory, in consequence of no rule being laid down for ascertaining the price of grain, at the time or place of importation: of course the trade continued to be carried on, on the payment of the low duties; agriculture languished; the dealers finding their account in feeding the populace with foreign grain, the prices of course keeping high: the average price of the quarter of wheat, for the ten years preceding this period, having been 2l. 8s. 10d., equal to 2l. 18s. 8d. of present money. It is suggested that by these laws the poorer sort of farmers became ruined, and the richer were weakened, being necessitated to turn their attention from corn to live stock, or any other objects by which they could support their families: the price of corn consequently rose on the manufacturer and labourer; and the importer of foreign grain became an important man, upon the ruins of the landholders, farmers, and others.

Notwithstanding this, the rest of this thoughtless and inattentive reign passed away without any alteration being made, though it continued for a period of fifteen years afterwards. Grain, of course, kept high in price: the average of the quarter of wheat, for the twenty years, from 1660 to 1680, having been 2l. 9s. 6d., equal to 2l. 19s. 9d. of the present money.

In 1685, on the accession of James II., the evasion of the duties payable on imported corn, and the distress caused by the vast importation of grain from abroad, were brought under the consideration of the legislature; and another act for the improvement of tillage passed; 1 Ja. II. c. 19, by which the defect of the above law was endeavoured to be obviated: it being there referred to the justices of the peace, in the several counties of England, where foreign grain might be imported, at their quarter sessions, after Michaelmas and Easter, on the oaths of two or more substantial persons, neither being merchants nor factors for the importation of corn, nor anywise concerned or interested in the corn to be imported, and each having a free estate of 20l. per annum, or a leafhold of 50l. per annum, to determine the prices of the several kinds of grain, which they were to certify to the principal officer of the customs in the several counties, for his rule and regulation.

The importation of victual from Ireland had been prohibited in Scotland, under very severe penalties, Char. II. par. 2. sess. 3. c. 3; only referring to the lords of the privy council power to admit of it, for such times as they should think proper, when the price within the kingdom should be at or above 8l. Scots, equal to 16s. of present money, for bear and meal; and 10l., equal to 20s., for wheat per boll. But in this year, 1686, by the act of Ja. VII. par. 1. sess. 3. c. 14, a total prohibition was enforced; all victual which should then be imported, being directed to be sunk or destroyed.

It is remarked by the writer we have quoted above, that for the ten years from 1650 to 1660, the average price of the quarter of wheat in this country had been 2l. 9s. 6d., equal to 2l. 19s. 5d. of present money; that from the latter period to 1670, it had been 2l. 8s. 10d., equal to 2l. 18s. 8d.; from this last period to 1685, it had been 2l. 10s. 8d., equal to 3l. 3s. 10d.; and that from 1683 to 1685 inclusive, it had been 2l. 4s. 3d., equal to 2l. 13s. 1d.

But the unfavourable tendency of the above system of corn laws is more fully shewn by the scale of prices, fixed by them for the exportation and importation of wheat, in the following tables, from 1560 to 1688, as taken from the above excellent work.
## CORN.

### TABLE of Exportation Prices and Duties for Wheat.

#### ENGLAND.

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</tbody>
</table>
### TABLE of Importation Prices and Duties for Wheat.

#### ENGLAND.

<table>
<thead>
<tr>
<th></th>
<th>Importation Prices per Quarter</th>
<th>Importation Duties per Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present Money</td>
<td>Money of the Time</td>
</tr>
<tr>
<td>Invited</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>Invited</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
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<tr>
<td>Invited</td>
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<tr>
<td>Invited</td>
<td>£. s. d.</td>
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</tr>
<tr>
<td>Invited</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>Permitted</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>When not above</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>When above that price</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>When not above</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>When not above</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>From that price to</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>And when above that price</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
</tbody>
</table>

#### SCOTLAND.

<table>
<thead>
<tr>
<th></th>
<th>Prices per Boll.</th>
<th>Duties per Boll.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Present Money</td>
<td>Money of the Time</td>
</tr>
<tr>
<td>Permitted</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>Prohibited</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>Prohibited</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
</tbody>
</table>

It is considered by Mr. Dirom as extraordinary, that the advantage which must necessarily accrue to a nation from raising the utmost possible quantity of corn, and exporting such portions of it as the consumption at home does not demand, should, for such a great length of time, have been misunderstood in this country; especially since the example of the neighbouring states, constantly bartering their excessive stock of this article for the raw materials and money of the kingdom, could scarcely have escaped notice for such a number of centuries. The importation trade is considered as operating, in various ways, in direct opposition to the benefit of the country; in consequence of which, agriculture became in a declining state; much of the ground was without cultivation; there was a decrease in the population, a proportionate reduction in the public revenue necessarily took place; and the number of remaining manufacturers were of course fed at an exorbitant price, by the products of foreign lands, the inhabitants of which were not unfrequently at enmity with us, but who drew vast sums from the country, and thus robbed it of its riches.

But we now approach a period in which a different system was acted upon, and in which a very material change took place in the laws respecting corn; but which was not accomplished by simply revising or amending the old acts, or by merely reducing the duties upon exported grain, but by at once giving up every idea of revenue from grain raised at home; and thus hesitating a new system which should invigorate and encourage the cultivation of the soil, while it afforded a new stimulus to the trade and navigation of the country.

In 1688, not long after the accession of William and Mary to the crown, the subsequent important act for encouraging the exportation of corn was passed, 1 Will. & Mary, c. 12, and ibid. c. 24, § 18, by which exportation was permitted from
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from England, when the prices at home did not exceed the following rates: malt or barley, 2s. 4d. the quarter, Winchester measure, equal to 28s. 10d. of present money; rye, 3s. 2d., equal to 38s. 5d. per quarter; and wheat, 4s., equal to 2l. 17s. 7d. the quarter; provided it was made in English shipping, and the master and two-thirds of the mariners, at half, being subjects of that state, and the exporter producing a certificate under his hand, of the quantity of grain shipped, to the collector of the customs at the port where the grain had been shipped, and proving the said certificate by the oaths of one or more credible persons; and upon bond, of at least 200l. for every 100 tons of corn, that the said grain should be exported to parts beyond the seas, and not again re-landed, the exporter should receive the following bounties: for every quarter of barley or malt, ground or unground, 2s. 6d., equal to 5s. of present money; for every quarter of rye, ground or unground, 2s. 6d., equal to 4s. 2d.; for every quarter of wheat, ground or unground, 5s., equal to 6s., and on producing a certificate, under the common seal of the chief magistrate in any places beyond the seas, or under the hands and seals of two known English merchants, that such corn had been actually landed; or upon proof, by credible persons, that such corn had been taken by enemies, or perished on the seas, the exporter's bond was to be given up; and the money, paid by the collector or commissioner of the customs, to pass in his account.

And the same system of policy was adopted soon afterwards in Scotland in 1695, by an act Will. par. r. c. 32, in which all export duties were taken off, and a bounty of eight marks granted upon ilk chalder of corn exported, when the prices did not exceed the following: wheat twelve pounds the boll equal to 1l. 42s. 4d.; bear, barley, or malt, eight pounds, equal to 16s. the boll; peas, oats, and meal, six pounds, equal to 12s. the boll; the whole being of Linlithgow measure, provided that the exportation was made in Scotch ships and by Scotchmen, the malt or ground three-fourths of the leamen being Scotchmen, power however being referred to the lords of the secret council, when the prices exceeded the fixed rates, to discharge and discontinue exportation.

The duties and subsidies payable upon exported corn from England, not having been given up by the former act, they were now, 1700, finally removed and taken away by another act, 11 and 12 Will. III. c. 20. § 4., whether upon ground or unground grain.

By this means what has been termed a new system of corn laws, was finally established in both this country and Scotland, and the act of Union taking place soon afterwards, 1706, their laws concerning grain were made alike. That when oats shall be sold at 1l. 12s. 6d. per running hundred, or for the average of the oatmeal within the last quarter, the grain or malt, at the rate of 1s. for every quarter of the oatmeal, to long as a duty is not paid, or as a bounty is not granted for exportation of other grains; and that the barley of Scotland have the same reward as barley.

It has already been seen that the prices and duties of corn imported, had been determined by the act of 1690, that for want of a new act for ascertaining the prices at the times and places of importation, the duties were evaded. The act of 1688, was to supply this defect; it enjoined and required the justices of peace of the several counties, at their respective quarter sessions, to inquire into and determine the prices of grain at fixed periods, and to send certificates thereof to the several customs houses within their jurisdiction, to be there hung up in a public place for the rule and direction of the parties concerned. But in consequence of neither the trouble of its execution being compensated, nor the neglect of it punished, it was in many places unattended to; and from no mode or rule having been substituted, in such an event, the defect was laid hold of by the importer, and much foreign grain was imported without payment of the duties during 1728 and 1729. And difficulties had likewise been met with from the modes employed in ascertaining the prices and quantities of grain exported.

There being, therefore, in different places a great neglect in the justices of peace, to determine the prices of grain, by which the duties on imported corn were to be regulated, the matter was now, 1729, taken up, and they were directed to do it in future, in their respective counties, at their next quarter sessions, or any adjournment, according to the act of 1670, and that on their omitting or neglecting to do it, and to certify the same, the collectors of the customs at the respective places of importation, were empowered to demand and receive the duties according to the lowest price of the several ports of corn mentioned in the last named act.

And to ascertain the quantity of grain shipped, for which a bounty was to be paid, in a better manner, the proper officers of the customs were directed to admeasure the same, by a tub, or measure, containing four Winchester bushels; and when such corn to be exported was brought to be shipped off in facks, they were empowered to make choice of any two of them out of twenty, and in that way compute the quantity to be shipped, on which the bounty was to be paid. And that the same powers should be employed in ascertaining the prices and quantity of bear, biggs, oatmeal, and malt, made from wheat or wheat malt, for being exported, s Geo. ii. c. 18. § 1, 2, 3, 4, 5. That in all such cases, as where any corn or grain had been imported since the first day of the Michaelmas quarter session, then last past, where the importers or proprietors had omitted to pay the respective duties on the same, they should forfeit and lose such grain, or the value of it.

Notwithstanding this, neglects still frequently occurred in determining the prices of grain, according to which the duties payable on importation were to be levied, and of course the means were afforded of much foreign grain being brought in, though the prices at home were very low; consequently another act was now, 1733, passed, for the better ascertaining the same, and preventing fraudulent importation, in which it was again recommended to the justices of peace, at their quarter sessions, in the several counties where foreign grain should or might be imported, to give in charge, to the grand jury, in the open court, to make inquiry and preferment, upon their oaths, of the common corn market prices, of middling English corn and grain, of the respective ports and quantities mentioned in the act, made in the 21st year of the reign of king Charles ii., as the same should be commonly bought and sold, in every such county, which preference should be certified by the said parties, in writing, to his majesty's chief officer and collector of the customs for the time being, at every such port, place, or haven, where importation should be made, and which should be hung up in some public place in the custom house, for general information and instruction: and that the custom duty upon foreign grain imported, as directed by the above act of Charles ii., should be collected and paid, according to the prices contained in such certificate. But that after importation, no foreign corn or grain was to be exported, or in any manner or shape laden on ship board, or put to sea, for carrying, conveying, or transporting it from one part or port of the kingdom to another, either by itself or in mixture with English corn, under the very severe penalties and forfeitures therein mentioned.

5 Geo. ii. c. 12.
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It is rated by Mr. Diron, in his very able "Inquiry into the Corn Laws and Corn Trade," that at this period agriculture had considerably recovered its strength, and that the exertions of the farmers had become vigorous and constant. That the prices of corn for several years preceding it had been very reasonable, and that a great export trade in corn had been carried on from this country; proper attention having been paid to the execution of these laws which were made to guard against fraudulent importations: the average price of the quarter of wheat, for the five years from 1731 to 1735 inclusive, being only 34s.; in 1736, 40s.; in 1737, 38s.; and in this year 1738, only 35s. 6d. Yet under these plentiful circumstances, the lower orders of the populace were excited to commit various outrages, by which the corn was destroyed. Therefore, in order to repress such disorders, an act was passed, 11 Geo. c. 23, by which such offenders were severely punished, and the inhabitants of the hundreds, in which such outrages should be committed, subjected to the payment of the damages.

The power of suspending the laws, in Scotland, which were made to prohibit the importation of foreign grain, or to buy, sell, or retail the same, which had rested on the act of 1703, and the two preceding ones therein referred to, having been formerly vested in the privy council of that kingdom; in consequence of the prices of grain having risen in 1740, from the severity of the winter, and some importation of foreign grain made contrary to law, from there existing no power of suspending the prohibitory acts there, on account of the act of the fifth Anne, c. 6, having done away the privy council, a temporary expedient without any new plan was now, 1741, had recourse to, and a law made, which transferred such power to the courts of Fustian, judiciary, and exchequer; the judges in these courts being required to determine on the necessity of exportation or importation, from the prices of grain in the county of Edinburgh. The duties payable in England by the act of the 22 Charles II. being required by the same law to be paid on the importation of grain into Scotland; the whole of the clauses and provisions of that act, as well as of that of the 2 George II., termed "An act to ascertain the custom payable on corn imported, being extended to Scotland."

Difficulties having arisen concerning the computation and measurement of wheat, meal, and other ground corn, on which a bounty was payable upon exportation, in order to adjust all differences arising thereon, by a law now (1751) made, the officers of the customs were empowered to allow the same bounty on the exportation of 234 pounds weight of wheat meal, or other ground corn or grain, as was allowed upon the exportation of four bushels of wheat, or other corn or grain, unground; and for the more effectually expediting the business, they were permitted to make choice of any two sacks out of twenty, from which to compute the weight.

24 Geo. II. c. 56. § 1.

These laws had greatly contributed to the extention of the export trade in grain, while plenty continued at home, with moderate prices. It is stated, that the average exportation of four years, from 1748 to 1751 inclusive, was 1,212,686 quarters annually; and that the average price of wheat, for the same four years, was 36s. 3d. the quarter.

From the money, applicable to the payment of the bounty, becoming inadequate to the discharge of the sums due on such extensive exportations, an act was now (1753) passed, 26 Geo. II. c. 15, by which the debentures, for the bounties on exported corn, were to carry an interest, when not paid within six months, at the rate of 3 per cent. per annum, according to the regulations of the act of the 12 and 13 of King William.

The crop of 1756 being defective and the prices of coarse rising, the populace from being long in the habits of plenty, mistaking the cause, committed various outrages in different places. And a law was brought forward in 1757; 30 Geo. II. c. 1, by which all sorts of corn, meal, malt, flour, bread, biscuit, or flarch, were prohibited exportation, before the 21st December 1757, except malt made to be exported, and declared to be to before the 21st December 1756, ships cleared out with it before the 25th being sufferd to proceed on their voyages: power was however referred to the king to remove the prohibition by proclamation, and to admit all persons, natives as well as foreigners, but no particular person or persons, to export grain. All duties, customes, rates, and impositions of every kind, on corn or flour, imported, or taken from the enemy and brought into the kingdom, were discontinued until the 24th of August 1757; and the same might be married coalways free of duty, 30 Geo. II. c. 7, and importation without duty was permitted also in ships of other friendly nations from any port or place whatever, 30 Geo. II. c. 9. § 14. After 11th March 1757, the distillation of low wines and spirits from any wheat, barley, malt, or any other sort of grain, or from any meal or flour, was prohibited during the space of two months, 30 Geo. II. c. 10; and it was afterwards continued to the 11th December in the same year; but with power to the king to suspend the act and permit it, by proclamation or an order of council, 30 Geo. II. c. 11.

By these laws and regulations, the exportation of corn is flated to have been completely checked, the quantity of about 80,000 quarters having been exported, previously to the prohibition, and about 150,000 quarters of foreign grain brought in.

There was however a restoration of the exportation trade in 1759, it proceeding as usual, with but little importation of foreign corn, but in consequence of the crop of 1762, being a little defective, importation took place from the rise of prices, which at the low duties was capable of being done, and of course was considerable, during that and the three years which followed it. During the last, from some cause of fear, an embargo was laid upon all ships laden with corn for exportation, the 26th of September, but which having been done contrary to law, it was necessary to pass an act of indemnity for it in the following year 1766, the 7 Geo. III. c. 7. On this is it remarked by the writer quoted above that there does not now seem to have been any sufficient ground for those measures; as in the year flated there were more than 300,000 quarters of grain exported, and under 250,000 imported.

In 1767, prohibitory laws were passed for a limited period, for the prevention of the exportation of corn, grain, meal, flour, bread, biscuit, and flarch, as well as the extraction of low wines, and spirits from wheat and wheat flour. Also a law for permitting, for a limited time, the importation of wheat and wheat flour, oats, and oatmeal, rye, and ryemeal without duty. 7 Geo. III. c. 3. 4. 5. 8. And in 1768 the same laws were renewed, having some additions made to them; it being now enacted that they should continue in force until twenty days after the beginning of the next session of parliament, or the exportation of the above different articles, as well as their distillation and preparation from wheat or wheat flour, was prohibited, except to particular British dependencies. And the importation both of wheat, wheat flour, barley, barleymeal, pulse, oats, oatmeal, rye, ryemeal, from any part of Europe, and maize or Indian corn and rice from North America, as well as wheat and wheat flour from Africa, were allowed without any duty. 8 Geo. III. c. 1, 2, 3. And in 1769, the prohibition was
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was continued until twenty days after the meeting of the next session of parliament, but the importation of rice from North America permitted duty free.

But in 1770 the former law of the preceding year, prohibiting the exportation of corn, grain, meal, malt, flour, bread, biscuit, and flax, and also the exportation of low wines and spirits from wheat or wheat flour, was continued in force until twenty days after the commencement of the ensuing session of parliament, provided that the said continuation might be abridged, and this act, or any part of it, altered and varied by any other act or acts to be enacted in the present session. 10 Geo. III. c. 1. Consequently by another law of this session, those parts of the former act, which prohibited the exportation of malt, were repealed. 10 Geo. III. c. 10. And an act was likewise passed for registering the prices at which corn was sold in the several counties of Great Britain, as well as the quantity exported and imported. 10 Geo. III. c. 39. And in 1771 prohibitory laws against the exportation and extraction of the above different articles were again passed, 11 Geo. III. c. 1. (with the exception of virtualing ships, on their being sent to British dependencies) to be in force till the twentieth day after the meeting of the next session of parliament. On the meeting of the session of parliament in the following year (1772), a prohibitory law was again passed, against the exportation and extraction of the above articles, to be in force till the twentieth day after the meeting of the next session of parliament. Afterwards an act was likewise passed, permitting the importation of wheat, wheat flour, rye, rye meal, and Indian corn, without duty, until the first day of December in the same year.

It is considered by the able inquirer into the corn laws and corn trade mentioned above, that all this would seem to have been recourrece to without any sufficient grounds, as the price of grain was not by any means very high, and the quantity exported from the year 1760 to 1770 greatly exceeded that which was imported.

On the meeting of parliament in 1773, an act was, however, passed, by which a free importation was permitted before the first day of January in the following year, for any wheat, wheat flour, rye, rye meal, barley, barley meal, oats, oat flours, peas, beans, tares, and all other sorts of pulse, from any part of Europe or Africa; and permission to carry the same coastways, under similar regulations to those of wheat or wheat flour the growth of this country, provided due entries were made according to the previous practice of the kingdom; and likewise for the free importation of wheat, wheat flour, Indian corn and meal, biscuit, pease, beans, tares, and all other sorts of pulse, from North America, under the same regulations. And another prohibitory law was enacted, 13 Geo. III. c. 3, 25, preventing the exportation and extraction of all the above named articles, wines and spirits, except for virtualing ships, or to British dependencies, until the first day of January 1774.

These laws, though radically injurious to the agriculture of the country, are conceived by Mr. Dirom, from their not trenching on the general system, as only productive of a temporary effect which might have been overcome.

By another law of the same year 1773, the 13 Geo. III. c. 40, such alterations and changes were however made, by the reduction of the export and import prices, and the rendering the duties on importation a mere tax, that a new system seems to have been introduced and established in the corn laws, destructive of the old code by which such benefits had accrued to the agriculture and commercial industry of the country; and by which, besides producing plenty and reasonable prices at home, by the disposal of the excescent flock in foreign markets, vast sums of money had been brought into the kingdom. The manner in which that useful code had been gradually raised, formed, and matured by experience, through a vast length of time, and finally established by the laws of 1670, 1688, and 1706, has been amply shown in the preceding part. But in order to place the different systems in a better point of contrast, and thereby afford a more distinct notion of their nature and principles, the excellent comparative tables introduced below, have been drawn from Mr. Dirom's "Inquiry into the Corn Laws, &c."

TABLE.—Old System of Laws for Importation of Grain.

<table>
<thead>
<tr>
<th>Importation Prices and Duties.</th>
<th>Money of the Time.</th>
<th>Present Money.</th>
</tr>
</thead>
<tbody>
<tr>
<td>For every quarter of wheat, when the prices did not exceed -</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>when above that price, and not exceeding -</td>
<td>2 16 0</td>
<td>4 0 0</td>
</tr>
<tr>
<td>when above that price -</td>
<td>4 0 0</td>
<td>8 0</td>
</tr>
<tr>
<td>1670 For every quarter of rye, peas, and beans, when the price did not exceed -</td>
<td>2 0 0</td>
<td>5 4</td>
</tr>
<tr>
<td>when above that price -</td>
<td>2 0 0</td>
<td>10 0</td>
</tr>
<tr>
<td>For every quarter of barley, when the price did not exceed -</td>
<td>1 12 0</td>
<td>1 18 0</td>
</tr>
<tr>
<td>when above that price -</td>
<td>0 0 0</td>
<td>2 8</td>
</tr>
<tr>
<td>For every quarter of oats, when the price did not exceed -</td>
<td>0 0 0</td>
<td>5 4</td>
</tr>
<tr>
<td>when above that price -</td>
<td>0 0 0</td>
<td>1 4</td>
</tr>
</tbody>
</table>

TABLE
CORN.

TABLE.—New System of Laws for Importation of Grain.

<table>
<thead>
<tr>
<th>Importation Prices and Duties</th>
<th>Prices</th>
<th>Duties</th>
</tr>
</thead>
<tbody>
<tr>
<td>1773 For every quarter of wheat, when the price was at or above</td>
<td>£ s. d. £ s. d.</td>
<td>£ s. d. £ s. d.</td>
</tr>
<tr>
<td>100 weight of wheat flour</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>quarter of rye, peas, or beans, when the price was at or above</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>barley, bear, or bigg, when the price was at or above</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>oats, when the price was at or above</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

It is remarked by the able writer, in respect to these tables, that, according to the old laws, but especially that of 1670, importation was not allowed till the prices at home were very high, and then even the duties were great, in consequence of which, foreign corn could be only introduced for the supply of times of scarcity, never being able to come in competition with the home produce. That, the law of 1688 did not even notice importation; it being solely enacted for the purpose of promoting and encouraging the agriculture of the country, by affording a new market for the superabundant grain, and in that way giving a new stimulus to the exertion of the people, to bring the waste and barren lands into a state of profitable cultivation: The buñifers of importation being left to the laws which previously existed, by which it was supposed to be sufficiently restricted, if not wholly prohibited.

It is further, that at the time those laws were passed, and till 1714, the interest, borne by money, was 6 per centum per annum, being of course proportionally of greater value than at present, when the interest is only 5 per cent per annum. Besides, the old acts did not, in fact, admit the importation of flour or ground corn at any period; only the grain at certain places, where the prices should happen to be very high. Neither did they allow the carrying of imported grain by sea, coastways, or the transporting of it to any other place, except that to which necessity had brought it; restrictions which seemed so essential as to require being enforced, under very severe penalties, by the act of the 5th of George II.

But that the new law, or that of 1773, commences with importation, and directs that, at any time when the price of the middling sort of British grain shall be at the prices stated in the above tables, at the several ports and places where the same should be imported; then all corns and duties, formerly payable on wheat, wheat flour, rye, peas, beans, barley, bear, bigg, and oats, imported into the kingdom, should cease; and be no longer payable, while these prices continued. That, instead of the former duties, those stated in the above table, should only be paid. It was likewise enacted, that the importation of oatmeal from Ireland, or any other part beyond the seas, into any port or place in Scotland, should be lawful, where the price of oatmeal exceeds 13s. the boll of 8 stone, troy weight.

Further, that by the new law importation is admitted, when the prices of grain at home are at such a reduced rate, as that foreign corn may always come in competition with the home produce in the markets, an evil that has constantly existed since the passing of the act; besides, by this law, wheat and other grain imported, may be conveyed coastways, and entered and landed in any other parts of the kingdom, at which the prices of middling British corn, grain, or flour, are at or above the respective rates stated in the table given above, under such regulations as wheat, wheat flour, rye, peas, beans, barley, bear, bigg, or oats, the growth of this kingdom, are permitted to be conveyed coastwise. Also, that on importing corn, grain, or flour, and paying the duties, where the same shall be again exported within six months, the duties were to be drawn back and repaid.

TABLE.—Old Laws for the Exportation of Grain.

<table>
<thead>
<tr>
<th>Exportation Prices and Bounties</th>
<th>Money of the Time</th>
<th>Present Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exportation Prices and Bounties</td>
<td>Prices</td>
<td>Bounties</td>
</tr>
<tr>
<td>1688 Upon every quarter of wheat, ground or unground, when the prices were at 1/2 or under</td>
<td>£ s. d. £ s. d.</td>
<td>£ s. d. £ s. d.</td>
</tr>
<tr>
<td>of rye, when the price was at or under</td>
<td>1 12 0 0</td>
<td>6 0</td>
</tr>
<tr>
<td>of barley or malt, when the price was at or under</td>
<td>1 4 0 0</td>
<td>2 0</td>
</tr>
<tr>
<td>of oatmeal, when the quarter of oats is at or under</td>
<td>0 15 0 0</td>
<td>0 18 0 0</td>
</tr>
</tbody>
</table>
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TABLE.—New Laws for the Exportation of Grain.

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<thead>
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<th>Exportation Prices and Bounties</th>
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<th>Bounties</th>
</tr>
</thead>
<tbody>
<tr>
<td>1773 Upon every quarter of wheat, or malt of wheat, when the price is under of rye, when the price is under</td>
<td>£ 2 4 d.</td>
<td>2 s. 6 d.</td>
</tr>
<tr>
<td>of barley, biggr, or malt made thereof, when the price is under</td>
<td>£ 1 8 d.</td>
<td>2 s. 2 d.</td>
</tr>
<tr>
<td>of oats, when the price is under</td>
<td>£ 1 6 d.</td>
<td>2 s. 2 d.</td>
</tr>
<tr>
<td>And for every quarter of oatmeal, containing of 276 lbs. avoidups</td>
<td></td>
<td>2 s. 2 d.</td>
</tr>
</tbody>
</table>

The provisions of the old laws of 1688 and 1706, have been already so fully stated and considered, that nothing further than what is contained in the above table seems requisite here.

Under the new law it was enacted, that, when the price of the quarter of wheat was at, or above, 44s.; rye, peas, and beans, 28s.; barley, bear, and bigg, 22s.; and oats, 14s., no such corn or grain should be transported or conveyed out of the kingdom, under severe penalties. That after the 1st day of January 1774, the bounties formerly allowed by law upon grain exported, should cease and determine; and that, in the place thereof, when the prices of it should be under the rates listed below, at the ports and places, whence the same should be shipped, there should be allowed, on the exportation of such grain, either ground or unground, being the growth of this kingdom, and shipped in British ships, the matter, and at least two-thirds of the mariners of such ships being subjects of his majesty, these bounties; that is to say, when the price of middling British wheat is per quarter under 44s., a bounty for every quarter of wheat, or malt made from it, 5s.; when the quarter of rye was under 28s., a bounty of 3s.; when the quarter of barley, bear, or bigg, was under 22s., a bounty of 2s. 6d. for every quarter of them, or of malt made from them, and when the quarter of oats was under 14s., a bounty of 2s. on every quarter, and 2s. 6d. upon every quarter of oatmeal, containing of 276 pounds avoidups weight.

Further, that, by the old laws, the justices of peace were to ascertain the prices at their quarter sessions, which, by the new law, was continued the same for England; but for Scotland it was transferred to the sheriffs of the different counties to be ascertained four times in every year, certificates of which were to be sent to the customs-houses within their jurisdiction respectively, so as to regulate the payment of the export and import bounties and duties.

However, so far as exportation was concerned, those rules were, in 1774, wholly altered, it being enacted, that the prices of exported corn, grain, and oatmeal should be regulated and directed according to the average prices, at which they should be respectively sold in the public market at or near to the port or place whence they should be intended to be exported, on the market day preceding that of their being shipped, and the bounties to be payable accordingly.

From the comparative statements given in the above tables, the difference in the principles and operations of these different systems of laws, will be easily understood, the former being calculated for the promotion of cultivation at home, and preventing the importation of foreign corn, unfees called for by necessity; while the latter is formed for the purpose of promoting the importation of grain from abroad, whether there may be any necessity for it or not. Thus the foreign cultivator is allowed the liberty of importing his corn into the country almost free from duty, while the bounty upon flour or meal produced from wheat is taken off.

But in order to expedite and render the conception of the various laws, which have been detailed above, more easy and familiar, we shall here introduce the tabular view of them given by the author of the " Inquiry into the Corn Laws and Corn Trade," as brought down to the year 1773.

<table>
<thead>
<tr>
<th>Anno Dom.</th>
<th>Anno Regis</th>
<th>Abbreviation of English Exportation Laws</th>
</tr>
</thead>
<tbody>
<tr>
<td>1369</td>
<td>34 Eliz.</td>
<td>Exportation prohibited.</td>
</tr>
<tr>
<td>1393</td>
<td>17 Rich.</td>
<td>Allowed, upon payment of the ordinary duties.</td>
</tr>
<tr>
<td>1425</td>
<td>4 Hen. VI.</td>
<td>The last law confirmed, but referring power to the king and council to restrain it.</td>
</tr>
<tr>
<td>1426</td>
<td>13 Hen. VI.</td>
<td>Allowed, when wheat did not exceed 6s. 8d. and barley 3s. per quarter.</td>
</tr>
<tr>
<td>1442</td>
<td>20 Hen. VI.</td>
<td>The last act confirmed for 13 years.</td>
</tr>
<tr>
<td>1444</td>
<td>23 Hen. VI.</td>
<td>And that act now made perpetual.</td>
</tr>
<tr>
<td>1552</td>
<td>3 &amp; 6 Ed. VI.</td>
<td>Prohibited, until the prices were at or under 6s. 8d. for wheat, 3s. 4d. for barley and malt, 2s. for oats, 4s. for peas and beans, and 3s. for rye per quarter.</td>
</tr>
<tr>
<td>1554</td>
<td>1 &amp; 2 P. &amp; M.</td>
<td>Prohibited, when the prices did not exceed 6s. 8d. for wheat, 4d. for rye, and 3s. for barley per qr.</td>
</tr>
<tr>
<td>1562</td>
<td>5 Eliz.</td>
<td>Allowed, when the prices did not exceed 10s. for wheat; 8s. for rye, peas, and beans; 6s. 8d. for barley and malt, per quarter.</td>
</tr>
<tr>
<td>1570</td>
<td>13 Eliz.</td>
<td>Allowed, under the direction of presidents, &amp;c. upon payment of duties.</td>
</tr>
<tr>
<td>1593</td>
<td>35 Eliz.</td>
<td>Allowed, when the prices did not exceed 20s. for wheat, 15s. 4d. for rye, peas, and beans, 10s. for barley and malt, upon payment of a duty of 2s. for every quarter of wheat, and 16s. for every quarter of other grain.</td>
</tr>
<tr>
<td>1604</td>
<td>2 James I.</td>
<td>Allowed, when the prices did not exceed 25s. 6d. for wheat, 15s. 4d. for rye, peas, and beans, and 14s. for barley and malt per quarter, and upon payment of the same duties.</td>
</tr>
<tr>
<td>1773</td>
<td></td>
<td>5s. Allowed.</td>
</tr>
</tbody>
</table>
### Table of Abbreviation of English Exportation Laws:

<table>
<thead>
<tr>
<th>Anno Dom.</th>
<th>Anno Regis</th>
<th>Abbreviation of English Exportation Laws</th>
</tr>
</thead>
<tbody>
<tr>
<td>1623</td>
<td>21 James I.</td>
<td>Allowed, when the prices did not exceed 32s. for wheat; 20s. for rye, peas, and beans, barley and malt per quarter, and upon payment of the same duties.</td>
</tr>
<tr>
<td>1627</td>
<td>3 Charles I.</td>
<td>Allowed upon the same terms with the last act.</td>
</tr>
<tr>
<td>1652</td>
<td>12 Charles II.</td>
<td>Allowed, when the prices did not exceed 48s. for wheat; 24s. for rye, peas, and beans; 20s. for barley and malt, and 16s. for oats per quarter, upon payment of the same high duties.</td>
</tr>
<tr>
<td>1663</td>
<td>15 Charles II.</td>
<td>Allowed, when the prices did not exceed 48s. for wheat, 32s. for rye, peas, and beans, peas, and beans; 20s. for barley and malt, and 16s. 4d. for oats per quarter, upon payment of the same high duties.</td>
</tr>
<tr>
<td>1670</td>
<td>22 Charles II.</td>
<td>Allowed, without limitation of prices, upon payment of the same high duties.</td>
</tr>
<tr>
<td>1683</td>
<td>W. &amp; M.</td>
<td>Not only allowed, when wheat was not above 48s. 4d. for rye, peas, and beans, peas, and beans; 20s. for barley and malt, and 16s. 4d. for oats per quarter, but bounties granted.</td>
</tr>
<tr>
<td>1690</td>
<td>10 Will. III.</td>
<td>Prohibited for one year, from the 10th February 1690.</td>
</tr>
<tr>
<td>1700</td>
<td>11 &amp; 12 Will. III.</td>
<td>Bounty suspended from 9th Feb. 1690, to 29th September 1700. The subsidy and all the duties payable upon corn and grain, ground and unground, bread, biscuit, and meal given up and totally removed.</td>
</tr>
</tbody>
</table>

### Table of Abbreviation of British Exportation Laws:

<table>
<thead>
<tr>
<th>Anno Dom.</th>
<th>Anno Regis</th>
<th>Abbreviation of British Exportation Laws</th>
</tr>
</thead>
<tbody>
<tr>
<td>1706</td>
<td>5 Anne.</td>
<td>Union settled-English bounties adopted over all the kingdom, and extended to oatmeal, bigg, and malt of wheat.</td>
</tr>
<tr>
<td>1709</td>
<td>8 Anne.</td>
<td>Exportation prohibited, until the 29th Sept. 1710.</td>
</tr>
<tr>
<td>1729</td>
<td>2 Geo. II.</td>
<td>Rules laid down for measuring corn to be exported, and for ascertaining the prices, &amp;c.</td>
</tr>
<tr>
<td>1732</td>
<td>5 Geo. II.</td>
<td>Grand juries at seafarms, to prevent the price of corn, and corn imported, not to be again exported, nor carried coastways.</td>
</tr>
<tr>
<td>1741</td>
<td>14 Geo. II.</td>
<td>Prohibited until the 23rd Dec. 1741.</td>
</tr>
<tr>
<td>1751</td>
<td>24 Geo. II.</td>
<td>Bounties upon corn exported in meal, to be paid according to the weight, at the rate of 44s. 8d. per hundred pounds for the quarter.</td>
</tr>
<tr>
<td>1753</td>
<td>26 Geo. II.</td>
<td>Money due upon debentures for corn exported, to bear interest at 3 per cent per annum, if not paid in six months after presenting the certificate.</td>
</tr>
<tr>
<td>1757</td>
<td>1 Geo. III.</td>
<td>Prohibited until the 25th Dec. 1757.</td>
</tr>
<tr>
<td>1758</td>
<td>2 Geo. III.</td>
<td>Corn-market established at Westminster; and, the same year, an affiz made for bread.</td>
</tr>
<tr>
<td>1766</td>
<td>6 Geo. III.</td>
<td>Exportation prohibited for a limited time; and, the same year, an embargo laid upon ships loaded with corn for exportation; and, the same year, the mayor and aldermen of London empowered to determine the prices of corn in January and July, as well as in April and October.</td>
</tr>
<tr>
<td>1767</td>
<td>7 Geo. III.</td>
<td>Exportation of grain, and distilling from wheat or wheat-flour, prohibited from the 26th Sept. to the 14th Nov. 1767.</td>
</tr>
<tr>
<td>1768</td>
<td>8 Geo. III.</td>
<td>Exportation of corn, and distilling from wheat or wheat-flour, prohibited until 20 days after the commencement of the next session of parliament.</td>
</tr>
<tr>
<td>1769</td>
<td>9 Geo. III.</td>
<td>Five thousand quarters of bigg allowed to be exported from the islands of Orkney, Shetland, and the same year, exportation of grain and distilling from wheat or wheat-flour prohibited for a limited time.</td>
</tr>
<tr>
<td>1770</td>
<td>10 Geo. III.</td>
<td>Corn register established; and weekly returns, from market towns in the several counties, to be made of the prices of wheat, rye, barley, oats, and beans, in England, and of bear or bigg in Scotland. Same year the exportation of corn, and the distilling from wheat or wheat-flour, prohibited till 20 days after the commencement of the next session of parliament.</td>
</tr>
<tr>
<td>1771</td>
<td>1 Geo. III.</td>
<td>Exportation of corn prohibited, and also the distilling from wheat or wheat-flour, until 20 days after the commencement of the next session of parliament.</td>
</tr>
<tr>
<td>1772</td>
<td>2 Geo. III.</td>
<td>Exportation of corn, and distilling from wheat and wheat-flour, prohibited until 20 days after the commencement of the next session of parliament.</td>
</tr>
<tr>
<td>1773</td>
<td>3 Geo. III.</td>
<td>Exportation of grain, and distilling from wheat and wheat-flour, prohibited until the 1st of Jan 1774. Same year, the former bounties and duties repealed, and a total alteration made in the corn laws.</td>
</tr>
<tr>
<td>1774</td>
<td>4 Geo. III.</td>
<td>Alteration of the method of ascertaining the prices of corn to be shipp'd for exportation.</td>
</tr>
</tbody>
</table>
### CORN.

#### TABLE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1468</td>
<td>15 Hen. VI.</td>
<td>Exportation permitted, when the price of grain, at home, did not exceed <em>per quarter</em>, for</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>0 6 8</td>
<td>2 4 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley</td>
<td>0 3 0</td>
<td>0 19 10</td>
</tr>
<tr>
<td>1554</td>
<td>1 P. &amp; M.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>0 6 8</td>
<td>0 19 10</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>0 4 0</td>
<td>0 16 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye</td>
<td>0 3 0</td>
<td>0 13 10</td>
</tr>
<tr>
<td>1562</td>
<td>5 Eliz.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>0 12 0</td>
<td>1 0 8</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>0 8 0</td>
<td>0 16 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, pease, and beans</td>
<td>0 6 8</td>
<td>0 13 10</td>
</tr>
<tr>
<td>1593</td>
<td>35 Eliz.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>1 0 0</td>
<td>2 1 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>0 13 4</td>
<td>1 7 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, pease, and beans</td>
<td>0 12 0</td>
<td>1 4 10</td>
</tr>
<tr>
<td>1604</td>
<td>2 James I.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>1 6 8</td>
<td>2 13 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>0 15 0</td>
<td>1 10 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, pease, and beans</td>
<td>0 14 0</td>
<td>1 8 0</td>
</tr>
<tr>
<td>1623</td>
<td>21 James I.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>1 12 0</td>
<td>3 4 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>1 0 0</td>
<td>2 0 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye</td>
<td>0 16 0</td>
<td>1 12 0</td>
</tr>
<tr>
<td>1627</td>
<td>3 Char. I.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>1 12 0</td>
<td>2 11 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>1 0 0</td>
<td>1 5 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye</td>
<td>0 10 0</td>
<td>1 12 0</td>
</tr>
<tr>
<td>1660</td>
<td>21 Char. II.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>2 0 0</td>
<td>2 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>1 4 0</td>
<td>1 8 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, pease, and beans</td>
<td>1 0 0</td>
<td>1 4 6</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley, malt, pease, and beans</td>
<td>0 16 4</td>
<td>0 19 2</td>
</tr>
<tr>
<td>1663</td>
<td>15 Char. II.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>2 8 0</td>
<td>2 17 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>1 12 0</td>
<td>1 18 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, pease, and beans</td>
<td>1 8 0</td>
<td>1 13 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley, malt</td>
<td>0 13 4</td>
<td>0 16 0</td>
</tr>
<tr>
<td>1668</td>
<td>1 W. &amp; M.</td>
<td>Permitted, when the price did not exceed, for</td>
<td>2 8 0</td>
<td>2 17 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>1 12 0</td>
<td>1 18 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye</td>
<td>1 4 0</td>
<td>1 8 9</td>
</tr>
</tbody>
</table>

* Prior to the year 1746, the exportation of all kinds of grain from England was totally prohibited.

### TABLE.

<table>
<thead>
<tr>
<th>Anno Domini.</th>
<th>Anno Regis.</th>
<th>Abbreviation of British Exportation Prices.</th>
<th>Money of the Time</th>
<th>Present Money</th>
</tr>
</thead>
<tbody>
<tr>
<td>1706</td>
<td>5 Anne.</td>
<td>Exportation of grain permitted, when the price of the quarter did not exceed, for</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat, ground or unground, or malt of wheat</td>
<td>2 8 0</td>
<td>2 17 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, ground or unground</td>
<td>1 12 0</td>
<td>1 18 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley, bear, or bigg, or malt, ground or unground</td>
<td>1 4 0</td>
<td>1 8 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oats</td>
<td>0 15 0</td>
<td>0 16 0</td>
</tr>
<tr>
<td>1773</td>
<td>3 Geo. III.</td>
<td>Exportation permitted, when the prices were under, for</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat</td>
<td>0 0 0</td>
<td>2 4 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye</td>
<td>0 0 0</td>
<td>1 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley, bear, or bigg, or malt thereof</td>
<td>0 0 0</td>
<td>1 7 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oats</td>
<td>0 0 0</td>
<td>0 14 0</td>
</tr>
</tbody>
</table>
### TABLE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1570</td>
<td>13 Elizabeth.</td>
<td>For wheat, when not prohibited other grain wheat exported by licence other grain by ditto</td>
</tr>
<tr>
<td>1593</td>
<td>35 Elizabeth.</td>
<td>For wheat, when the price did not exceed other grain as per exportation prices</td>
</tr>
<tr>
<td>1604</td>
<td>2 James I.</td>
<td>For wheat, when the price did not exceed other grain as per exportation prices</td>
</tr>
<tr>
<td>1623</td>
<td>21 James I.</td>
<td>For wheat, when the price did not exceed other grain as per exportation prices</td>
</tr>
<tr>
<td>1627</td>
<td>3 Charles I.</td>
<td>For wheat, when the price did not exceed other grain per exportation prices</td>
</tr>
<tr>
<td>1660</td>
<td>12 Charles II.</td>
<td>For wheat, when the price did not exceed Rye, peas, beans, barley, malt, buck wheat Oats when not above</td>
</tr>
<tr>
<td>1663</td>
<td>15 Charles II.</td>
<td>For wheat when the price did not exceed Rye, peas, beans, barley, malt, buck wheat Oats when not above</td>
</tr>
<tr>
<td>1670</td>
<td>22 Charles II.</td>
<td>For wheat, without limitation of price Rye, peas, beans, barley, malt, buck wheat Oats</td>
</tr>
</tbody>
</table>

### TABLE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1688</td>
<td>1 Will. &amp; Mary.</td>
<td>For wheat, when the price did not exceed Rye, ground or unground, when not above Barley and malt, ground or unground, when not above</td>
</tr>
<tr>
<td>1706</td>
<td>5 Anne.</td>
<td>For wheat or malt made of wheat, ground or unground, when not above Rye, ground or unground, when not above Barley, bear, or bigg, malt, ground or unground, when not above Quarter of oatmeal when oats not above</td>
</tr>
<tr>
<td>1773</td>
<td>13 George III.</td>
<td>For wheat and malt of wheat, when the price is under Rye, wheu under Barley, bear, or bigg, when under Oats, when under And for every quarter of oatmeal consisting of 276 pounds avoirdupois.</td>
</tr>
</tbody>
</table>

### TABLE.

<table>
<thead>
<tr>
<th>Price of the Quarter of Grain.</th>
<th>Duties per Quarter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>1 0 0</td>
<td>2 1 5</td>
</tr>
<tr>
<td>1 6 8</td>
<td>2 1 3 4</td>
</tr>
<tr>
<td>1 1 3</td>
<td>3 4 0</td>
</tr>
<tr>
<td>1 1 2</td>
<td>2 1 1 2</td>
</tr>
<tr>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>0 1 6</td>
<td>0 1 9 2</td>
</tr>
<tr>
<td>2 8 0</td>
<td>2 1 7 7</td>
</tr>
<tr>
<td>0 1 3 4</td>
<td>0 1 6 0</td>
</tr>
<tr>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
<tr>
<td>0 0 0</td>
<td>0 0 0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Price of the Quarter of Grain.</th>
<th>Bounties per Quarter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>2 8 0</td>
<td>1 1 2 0</td>
</tr>
<tr>
<td>0 0 0</td>
<td>1 8 0</td>
</tr>
<tr>
<td>0 0 0</td>
<td>0 1 4 0</td>
</tr>
</tbody>
</table>
CORN.

**TABLE.**

<table>
<thead>
<tr>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>1463</td>
<td>3 Edw. IV.</td>
<td>Importation of foreign grain permitted, when the prices at home per quarter did exceed, for</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat -</td>
<td>1 6 8</td>
<td>1 15 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye -</td>
<td>0 4 0</td>
<td>1 11 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley -</td>
<td>0 3 0</td>
<td>0 13 10</td>
</tr>
<tr>
<td>1660</td>
<td>12 Char. II.</td>
<td>Importation permitted, when the prices did exceed, for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat -</td>
<td>2 4 0</td>
<td>2 12 9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye -</td>
<td>1 16 0</td>
<td>2 2 2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Beans, barley, and malt -</td>
<td>1 6 8</td>
<td>1 12 0</td>
</tr>
<tr>
<td>1663</td>
<td>15 Char. II.</td>
<td>Importation permitted, when the prices did not exceed, for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat -</td>
<td>2 8 0</td>
<td>2 17 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, peas, or beans -</td>
<td>1 12 0</td>
<td>1 18 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley, malt, or buck wheat -</td>
<td>1 8 0</td>
<td>1 13 7</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oats -</td>
<td>0 13 4</td>
<td>0 15 0</td>
</tr>
<tr>
<td>1670</td>
<td>12 Char. II.</td>
<td>Importation permitted, when the prices did not exceed, for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat -</td>
<td>2 13 4</td>
<td>3 4 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, peas, or beans -</td>
<td>2 0 0</td>
<td>2 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley, malt, or buck wheat -</td>
<td>1 12 0</td>
<td>1 13 5</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oats -</td>
<td>0 16 0</td>
<td>0 19 2</td>
</tr>
<tr>
<td>1723</td>
<td>13 Geo. III.</td>
<td>Importation permitted, when the prices were at or above, for</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Wheat -</td>
<td>0 0 0</td>
<td>2 8 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Rye, peas, or beans -</td>
<td>0 0 0</td>
<td>1 12 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Barley or malt -</td>
<td>0 0 0</td>
<td>1 4 0</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Oats -</td>
<td>0 0 0</td>
<td>0 10 0</td>
</tr>
</tbody>
</table>

*This is the act, in which the insertion of the word not in the important clause, entirely altered the intention of the law.*

**TABLE.**

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>1202</td>
<td>3 John.</td>
<td>Importation of foreign grain invited.</td>
<td>1766</td>
<td>6 Geo. III.</td>
<td>Importation of foreign grain permitted, for a limited time, duty free.</td>
</tr>
<tr>
<td>1215</td>
<td>16 John.</td>
<td>Invited.</td>
<td>1767</td>
<td>7 Geo. III.</td>
<td>Importation permitted, for a limited time, duty free.</td>
</tr>
<tr>
<td>1297</td>
<td>25 Edw. I.</td>
<td>Invited.</td>
<td>1769</td>
<td>9 Geo. III.</td>
<td>Importation of rice permitted, for a limited time, duty free.</td>
</tr>
<tr>
<td>1328</td>
<td>2 Edw. III.</td>
<td>Invited.</td>
<td>1772</td>
<td>12 Geo. III.</td>
<td>Importation permitted duty free to 18 November.</td>
</tr>
<tr>
<td>1350</td>
<td>25 Edw. III.</td>
<td>Invited.</td>
<td>1773</td>
<td>13 Geo. III.</td>
<td>Permitted, duty free to 18 of January 1774. Same year the old corn laws totally altered, and importation of foreign grain and flour permitted, at all times and places, when the price of the quarter was at or above 4s. for wheat; 3s. for rye, peas, and beans; 24s. for barley; and 16s. for oats. Importation of oatmeal into Scotland permitted duty free, when the price there shall exceed 16s. per boll weighing 8 stones Troy.</td>
</tr>
<tr>
<td>1360</td>
<td>34 Edw. III.</td>
<td>Prohibited, until the price exceeded 6s. 8d. for wheat, 4s. for barley per quarter.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1463</td>
<td>3 Edw. III.</td>
<td>Allowed, upon payment of different duties according to the prices.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1560</td>
<td>13 Char. II.</td>
<td>Regulations to prevent fraudulent importation.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1663</td>
<td>15 Char. II.</td>
<td>Allowed, upon payment of different duties according to the prices.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1670</td>
<td>22 Char. II.</td>
<td>Allowed, upon payment of different duties according to the prices.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1685</td>
<td>1 James II.</td>
<td>Regulations for ascertaining the price of corn at the time of importation, and for receiving the duties, according to the prices.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1729</td>
<td>2 Geo. II.</td>
<td>Further regulations amended the prices, and prohibiting corn imported to be again exported, or carried coastways.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1732</td>
<td>5 Geo. II.</td>
<td>Duties upon the importation of corn suspended until the 24th</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1757</td>
<td>30 Geo. II.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

1: **TABLE.**
### TABLE.

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1662</td>
<td>2 Charles II.</td>
<td>For wheat, when the price did not exceed when it exceeded that price</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>1663</td>
<td>15 Charles II.</td>
<td>For wheat, when the price did not exceed when it exceeded that price</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
<tr>
<td>1670</td>
<td>22 Charles II.</td>
<td>For wheat, when the price did not exceed when above that price, and not exceeding when above that price</td>
<td>£. s. d.</td>
<td>£. s. d.</td>
</tr>
</tbody>
</table>

#### British Importation Duties.

<table>
<thead>
<tr>
<th>1773</th>
<th>13 Geo. III.</th>
<th>When the price of wheat is at or above when above that price, and not exceeding when above that price</th>
<th>£. s. d.</th>
<th>£. s. d.</th>
</tr>
</thead>
</table>

### TABLE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1454</td>
<td>17 James II.</td>
<td>Importation of foreign grain invited to be made, either by foreigners or denizens.</td>
</tr>
<tr>
<td>1493</td>
<td>5 James IV.</td>
<td>Invited.</td>
</tr>
<tr>
<td>1603</td>
<td>15 Charles II.</td>
<td>Allowed from Ireland upon payment of a duty of 3l. per boll, when meal and barley did not exceed the price of 8l. per boll at home.</td>
</tr>
<tr>
<td>1672</td>
<td>24 Charles II.</td>
<td>Importation of victual from Ireland prohibited under severe penalties.</td>
</tr>
<tr>
<td>1687</td>
<td>3 James VII.</td>
<td>Prohibition to import victual from Ireland renewed, and victual so imported ordered to be destroyed.</td>
</tr>
<tr>
<td>1703</td>
<td>2 Anne.</td>
<td>Importation of victual prohibited from foreign parts, until the price of the boll of grain exceeds 12l. for wheat, 8l. for bear, meal, and malt, and 6l. for oats and pease; but with power to the lords of the privy council to suspend this prohibition when necessary.</td>
</tr>
<tr>
<td>1741</td>
<td>14 Geo. II.</td>
<td>Importation permitted, when the prices of grain, in the county of Edinburgh, exceeded 40s. for wheat; 20s. for pease and beans; 18s. for bear and barley; and 13s. 4d. for oats, per quarter, and 8l. Scots, per boll, for oatmeal, upon payment of the duties fixed by the English acts of the 22d Charles II.</td>
</tr>
</tbody>
</table>
### TABLE.

<table>
<thead>
<tr>
<th>Anno Domini</th>
<th>Anno Regis</th>
<th>Abbreviation of Scotch Exportation Laws</th>
</tr>
</thead>
<tbody>
<tr>
<td>1655</td>
<td>13 Mary</td>
<td>Exportation of grain prohibited under severe penalties.</td>
</tr>
<tr>
<td>1657</td>
<td>20 James VI</td>
<td>Prohibited.</td>
</tr>
<tr>
<td>1663</td>
<td>15 Charles II</td>
<td>Exportation of grain permitted when the price of victual at home was under 12l. for wheat, 8l. for bear and barley, and 8 merks for peas and oats, per boll; upon payment of the usual duty.</td>
</tr>
<tr>
<td>1669</td>
<td>1 Cha' II</td>
<td>All duties payable upon grain exported removed, except one merk per chalder upon every kind of victual.</td>
</tr>
</tbody>
</table>

### TABLE.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1663</td>
<td>15 Cha' II</td>
<td>Duties payable upon the boll of all kinds of grain imported, when the boll of barley and meal did not exceed at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1703</td>
<td>2 Anne</td>
<td>A duty of 40s. per boll, besides the former duties upon each boll of grain from England for feed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1741</td>
<td>14 Geo. II</td>
<td>The same duties to be paid in Scotland, as are payable in England upon grain imported by the English act of 22 of Charles II.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1669</td>
<td>21 Cha' II</td>
<td>Duty upon each chalder of grain exported, when under the above prices at home</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1695</td>
<td>7 William</td>
<td>Duties upon exportation ceased, and bounties commenced.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Scotch Exportation Duties.

- For wheat, when the price of the boll is under 8. 0. 0. 0. 16. 0. 3. 0. 0. 6. 0. 2. 0. 0. 4. 0. 13. 4. 1. 12. 0. 12. 0. 4. 0. 5. 0. 0. 6. 5. 6. 8. 2. 0. 8. 0. 5. 0. 6. 0. 0. 0. 0. 0. 8. 0. 0. 12. 0. 6. 0. 0. 12. 0. 10. 8. 0. 6. 0. 0. 0. 8. 10. 8. |
- For bear, barley, and malt, at or under 8. 0. 0. 0. 16. 0. 3. 0. 0. 6. 0. 2. 0. 0. 4. 0. 13. 4. 1. 12. 0. 12. 0. 4. 0. 5. 0. 0. 6. 5. 6. 8. 2. 0. 8. 0. 5. 0. 6. 0. 0. 0. 0. 0. 8. 0. 0. 12. 0. 6. 0. 0. 12. 0. 10. 8. 0. 6. 0. 0. 0. 8. 10. 8. |
- Peas, oots, and meal, at or under 8. 0. 0. 0. 16. 0. 3. 0. 0. 6. 0. 2. 0. 0. 4. 0. 13. 4. 1. 12. 0. 12. 0. 4. 0. 5. 0. 0. 6. 5. 6. 8. 2. 0. 8. 0. 5. 0. 6. 0. 0. 0. 0. 0. 8. 0. 0. 12. 0. 6. 0. 0. 12. 0. 10. 8. 0. 6. 0. 0. 0. 8. 10. 8. |

As it would appear from what has been advanced in the preceding pages, that on the experience of a great length of time, it would seem that the laws and regulations in respect to grain, which were brought forward under the acts of 1670, 1688, 1706, and 1732, had considerable influence and effect in promoting the improvement of agriculture, increasing the quantity of corn, and thereby preventing the necessity of having recourse to importation for a precarious and uncertain supply; it may not only be proper to afford the following tabular view from the valuable work quoted above, of the prices, bounties, and duties, as laid down by them, by which their principles and objects may be more clearly comprehended, but also to contrast them with the regulations concerning those which have been enacted by the law of 1791.
CORN.

TABLE.—Prices, Bounties, and Duties, on Exportation and Importation of Grain
by the former Acts.

<table>
<thead>
<tr>
<th>Bounties per Quarter.</th>
<th>Exportation.</th>
<th>Price of Grain per Quarter.</th>
<th>Importation.</th>
<th>Duties per Quarter.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. WHEAT, WHEAT-FLOUR.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 5 0 0 6 0 Bounty, when the price did not exceed</td>
<td>2 8 0 2 17 7</td>
<td>there was payable upon importation</td>
<td>16 0 0 19 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>when the price was not above</td>
<td>2 13 4 3 4 0</td>
<td>there was payable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>when above that price and not above</td>
<td>4 0 0 4 16 0</td>
<td>there was payable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and when above that price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. RYE, PEASE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 3 6 0 4 2½ Bounty, when the price did not exceed</td>
<td>1 12 0 1 18 5</td>
<td>there was payable upon importation</td>
<td>16 0 0 19 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>when the price was not above</td>
<td>2 0 0 2 8 0</td>
<td>there was payable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and when above that price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. BARLEY, BEAR.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 2 6 0 3 0 Bounty, when the price did not exceed</td>
<td>1 4 0 1 8 9</td>
<td>there was payable upon importation</td>
<td>16 0 0 19 2</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>when the price was not above</td>
<td>1 12 0 1 18 5</td>
<td>there was payable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and when above that price</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. OATS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>0 2 6 0 3 0 For the quarter of oatmeal, when the price of oats did not exceed</td>
<td>0 15 0 0 18 0</td>
<td>there was payable upon the importation of oats</td>
<td>5 0 0 6 5</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>when the price was not above</td>
<td>0 16 0 0 19 2</td>
<td>there was payable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and when above that price</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TABLE.
TABLE.—Prices, Bounties, and Duties on Exportation and Importation of Grain, by the latter Acts.

<table>
<thead>
<tr>
<th>Bounties per Quarter</th>
<th>Prices of Grain per Quarter</th>
<th>Duties per Quarter</th>
</tr>
</thead>
<tbody>
<tr>
<td>£ s. d.</td>
<td>£ s. d.</td>
<td>£ s. d.</td>
</tr>
<tr>
<td>0 5 0</td>
<td>2 4 0</td>
<td>1 4 3</td>
</tr>
<tr>
<td></td>
<td>2 6 0</td>
<td>0 2 6</td>
</tr>
<tr>
<td></td>
<td>2 10 0</td>
<td>0 0 6</td>
</tr>
<tr>
<td></td>
<td>3 14 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 14 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 8 0</td>
<td>1 2 0</td>
</tr>
<tr>
<td></td>
<td>1 10 0</td>
<td>0 1 6</td>
</tr>
<tr>
<td></td>
<td>1 14 0</td>
<td>0 0 3</td>
</tr>
<tr>
<td></td>
<td>1 4 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 4 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 17 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 17 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 4 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 4 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 17 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 17 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 2 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 1 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 0 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 4 0</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 2 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 0 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 4 3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 2 6</td>
<td></td>
</tr>
<tr>
<td></td>
<td>0 0 6</td>
<td></td>
</tr>
</tbody>
</table>

N. B.—Flour, meal, and malt, are regulated in proportion to the several sorts of grain. The importation of malt is at all times prohibited.

* The bounty, by the tables in the act of parliament, appears to be given only upon rye, and not also upon the exportation of peas and beans.
CORN.

It has been observed on these tables, by Mr. Mackie, that though the import prices and duties are higher in a small degree in the latter, than was the case in the act of 1773, which is so far returning to the old system, yet that the encouragement held out to the husbandman is considerably less, than was the case under the ancient regulations. Without considering the difference in the value of money between the periods, it may be noticed, he says, that the bounty of 2s. on wheat, is now withdrawn when it reaches 42s., and exportation flopped when it advances to 46s. the quarter; while, by the old laws, exportation, with the bounty, was continued till the price reached 45s.

And importation, by this act, is permitted on low duties, when the price of wheat advances to 36s. 10d.; while, by the old acts, the duties were equal to a prohibition, until the price reached 4½, and even then, the duty was high, instead of being reduced to almost nothing, as is now the case, before wheat reaches a price capable of repaying the farmer in an unfavourable season. In fact, it is contended, that agriculture has derived little protection or support from the late laws, its continued prosperity depending rather on the impossibility of procuring adequate supplies of grain from abroad, by which the farmers in this country have, in a great degree, retained the monopoly of the markets, than the countenance it has received from the legislature.

Since the period already noticed, however, the above plan has been relinquished, and different changes and alterations have been made in the corn laws, by which it would seem that some parts of the old system have been again in some measure reverted to.

The act of 1773, by so greatly lowering the rates and duties on the importation of foreign grain, had contributed to fix and establish the import system, and speculation in corn, under the direction of the merchants, by which, from the prices of grain in the markets abroad, being commonly so much below those of this country, they were contantly ready, by some contrivance or other, to open the ports, before the price of the home grain in the markets, came to the rate at which foreign grain was permitted to be imported. It consequently became necessary, from time to time, to pass acts, in order to counteract such designs, and render the general law more efficient.

Accordingly, in 1781, an act was made, 21 Geo. III. c. 50, by which so much of the acts of the 7 Ja. II. 5 Geo. II. 6 Geo. III. and 14 Geo. III. as related to the ascertaining of the prices of medium English wheat, and other grain, in the port of London, and counties of Kent and Effex, was repealed; and, in the place of which, an inspector was appointed, to fix the weekly average prices, from the actual sales in the said port; by which exportation, and the bounties paid thereon, were to be regulated. But besides this, an average price is directed to be made up from the weekly returns of each three months, on the first day of the fictions held in London, in January, April, July, and September, for the purpose of regulating importation for three months, and the duty payable thereon, in the port of London, and the above-mentioned counties. And, in 1783, the law respecting corn was lupended, importation being permitted at law duties, and exportation prohibited, till the 27th August of the same year, in England, and the 25th of September in Scotland. 25 Geo. III. c. 1. 53. 81.

In 1789, an act was passed, 29 Geo. III. c. 38, for improving and extending the act of the 21 Geo. III. c. 50, by which every corn-factor in London, and the luburbs, was necessitated to give in weekly returns of his sales to the inspectors; and importation was permitted into London, Kent, and Effex, when the prices of middling British grain reached the rates fixed in the act of 1773, as formed from the six last weekly returns in the port of London, immediately preceding the quarterly sessions, with the exception of oats, which were formerly directed to be regulated by twelve weekly returns; the act being extended to the maritime counties of England, which were divided into eleven districts. The inspectors of corn returns, were to be appointed by the judges of peace in each county, and directed to make weekly returns of the prices of grain, from not more than twelve, or less than eight market towns in each county, the average prices, made from the weekly returns, being directed to be sent to the collectors of the ports in the district, for regulating exportation; and the average prices for the whole district, formed from the six weekly returns, immediately preceding the first day of February, of May, of August, and of November, were to regulate the importation of foreign grain and the duties paid thereon.

In 1790, an act of indemnity, 30 Geo. III. c. 1, was passed, for abrogating the corn laws, in pursuance of orders from the privy council of the 11th and 18th of November, 23d of December 1789, 2d and 5th of January 1790, by which the above orders are confirmed, and the laws respecting corn suspended; no fort of British grain being permitted to be exported, except the particular specified quantities for the use of the sugar colonies; but all kinds of foreign grain permitted to be brought freely into every port in the kingdom at the low duties; the act being to continue in full force, until the 29th of September in this year.

And, by the 30 Geo. III. c. 43, the execution of these laws was further suspended, until the 28th February 1791, full powers however being given to the privy council, to admit the exportation of all kinds of British grain, whenever it judged it necessary. Further, by the 31 Geo. III. c. 4, the two preceding acts were amended; and, by the introduction of a clause in the general corn law, passed this session, they were continued in full force until its commencement on the 15th of November 1791.

It is remarked by Mr. Mackie, in his "Letters on the Corn Laws," that none of these acts for rendering the law of 1773 more efficient, were extended to Scotland, the consequence of which was, that from the average prices not being fixed and determined by the actual sales, whenever the ports were opened for the importation of grain from abroad into it, it contently took place, when the current price of produce there was greatly under the reduced rates at which that act even admitted the importation of foreign corn; namely, wheat at 48s. the quarter, Winchester measure, &c. And that, on the contrary, when the overplus quantity of corn was in such abundance, as to permit exportation, the ports there were constantly shut, before the price of the home produce reached the limit at which exportation ceases; both of which causes operate unfavourably for the agriculture of the country.

In 1791, an act for a new general corn law was passed, 31 Geo. III. c. 38, commencing on the 15th of November of the same year, by which the 1 Ja. II. c. 19. 7 Geo. II. c. 12. 7 Geo. III. c. 39.; 13 Geo. III. c. 43.; 21 Geo. III. c. 50. and 79 Geo. III. c. 58.; and so much of the 15 Cha. II. c. 7, as prohibits the buying of corn to fell again, and laying it up in granaries, when above certain prices, were repealed. By
By this act, the maritime counties of England are divided into twelve districts, and Scotland into four districts, making sixteen in the whole. The prices of grain at the corn exchange in London, being made to regulate the exports and imports of the first district, which comprehends the ports of that city, together with the counties of Kent, Essex, and Suffolk. And, in the other districts, the particular market towns, at which the prices and quantities of grain actually sold are collected, are stated in the act. The dealers in grain are directed to give in, on oath, weekly accounts of their actual sales for that time, to the officer termed the inspector of returns, who, from such returns, is to make out an account of the general weekly average price of the whole district, which is to be transmitted to the collectors of the counties at the different ports within the said district, by which the bounties payable on exportation are to be regulated.

And, at four different times in the year, as within the space of seven days after the 1st of February, 15th of May, 15th of August, and the 15th of November, the receivers of corn returns in each district, are to make up the average prices of corn within the same, from the last six weekly returns thereof, with the exception of oats, which is to be made up from twelve weekly returns, this quarterly average being sent to the collectors of the counties at the different ports within the said district, at such periods as mentioned above, by which importation, and the duties payable thereon, are to be regulated for the following quarter.

But, in Scotland, the average prices of grain are not ascertained for the same purposes. The sheriffs of the different counties, once in the month, convene juries for fixing the average price at which it is usually selling, but the witnesses brought forward produce no account of their actual purchases or sales, only depending on what they believe from their own experience, and the opinion of others, to be the current prices. Monthly accounts of the average prices of grain within each county, are made from the sheriffs, by the sheriffs of the different counties, which are sent up to the receiver of corn returns in the port of London, from which the receiver is to make up an average account for each district, and transmit it to the collectors of the ports within the same, which is to regulate the bounties upon exportation; and, at the above-named quarterly periods, he is to make up the average prices from the last six monthly returns, which are to regulate the duties payable upon importation for the following quarter.

But corn from abroad may be imported and landed at any time without payment of duties, provided it be warehoused under certain regulations, but cannot be taken out of the warehouse for home consumption, until the low duties are paid, and such other duties as are payable at the time, in the district where intended to be used; nor can corn of either foreign or home produce be conveyed coasts away from the port of any district, where exportation is not permitted, at the time of shipping, to the ports of any district in which exportation is permitted.

And when the general average of the whole country exceeds the rates of import at the low duties, his majesty, in such case, the parliament not being sitting, can, with the consent of the privy council, suspend the execution of the act so far as to prohibit exportation wholly, and permit importation at the low duties, such permission continuing in force three months; but this power does not extend to prohibiting the exportation of foreign grain warehoused before.

Since the above act, other laws have been made for the further regulation of the trade in grain. In 1793, an act of indemnity was passed, the 35 Geo. III. c. 3, for putting a stop to the execution of the general corn law, by an order of council of the 5th of November 1792, prohibiting the exportation of home produce, and granting liberty to import corn from abroad, until the 1st of March 1793; and for further suspending the said law, by granting power to his majesty and council at any time during the sitting of the parliament, to permit importation and prohibit exportation.

And by the 33 Geo. III. c. 63, the general corn law of 1791 was altered, by the repeal of the clauses for ascertaining the average prices of corn in England, and substituting others of a similar tendency in their stead. And further, by granting liberty to his majesty and council, when parliament is not sitting, to permit the importation of grain, and prohibit the exportation of home produce, when the general average of the whole kingdom exceeds the prices at which grain can be imported at the low duties from Ireland and the colonies of North America, namely, wheat, 49s. rye, 32s. barley, 21s. oats, 15s. Likewise, by allowing exportation with a bounty of 1s. 6d. when oatmeal is under 17s. per holl; prohibiting exportation to foreign countries, when above 14s. the holl.

The law of 1795, the 35 Geo. III. c. 4, passed the 17th February, suspends the general corn law of 1791, by giving power to his majesty, with the consent of the privy council, to prohibit the exportation and permit the importation of all sorts of grain from abroad, without the payment of any duties whatsoever. The act to be in force until six weeks after the next parliament has met.

In consequence of a report of a committee of the house of commons, made in 1804, on which it appeared, that the price of corn from 1791 to the 1st of 1803, though very irregular, and increased on the average greatly by the years of scarcity, has in common afforded a fair profit to the grower; but that, from the diminution of the usual high prices having increased industry, by which large tracts of waste land have been brought into cultivation, which, joined to the two last productive seasons, and other causes, have occasioned such a depression in the value of corn, as may tend to the discouragement of agriculture, unless supported by the aid of the legislature. Accordingly an act was this year passed the 44th Geo. III. c. 199, for the purpose of regulating the importation and exportation of corn, and the bounties and duties payable on the same; and by which it was enacted, that from and after the 15th of November, 1804, so much of the act of the 51 Geo. III. c. 32, as regulates the prices at which British corn, grain, malt, meal, flour, and biscuit, may be exported, except to Ireland, and at which corn from abroad, grain, meal, and flour may be imported, except from Ireland, and as fixes the duties and bounties payable thereon, be repealed. Further, that, by this act, the importation and exportation of grain, into and from England and Wales, be regulated by the average price of the twelve maritime districts, and into or from Scotland, by the average price of the four districts of it; and that the bounties and duties be regulated by schedules annexed to the act; that whenever the average shall be under the prices, at which corn may be importable into Great Britain and Ireland, from abroad, on the low duties, exportation shall be prohibited by the act, and that the importation and exportation of corn into and from Ireland shall be regulated by schedules annexed to the act. The first schedule shows the prices, to which the scale of bounty is to attach on the export of corn, &c., and the prices at which the exportation is prohibited. According to which when may be exported.
CORN.

when at or under 48s. the quarter, with a bounty of 3s.; rye at or under 32s. with a bounty of 3s.; peas and beans are exportable without a bounty, until at or under 35s.; barley, bear, or bigg, or malt made of barley, bear, or bigg, may be exported at or under 28s. with a bounty of 2s. 6d.; oats at or under 16s. with a bounty of 2s.; wheat, flour, biefinn, &c. with a bounty of 1s. 6d. per cwt.; wheat meal, with a bounty of 1s. 3d. per cwt.; barley, bear, or bigg meal, with a bounty of 1od. per cwt.; and oatmeal, with a bounty of 1s. per cwt. But that when the price of wheat exceeds 5s. that of rye 3s. that of peas and beans 3s. that of barley, bear, or bigg, or malt made of them, 3s. and that of oats 19s. no export is to be allowed.

The second schedule shews the prices, according to which high or low duties are to take place on importation. When imported from the province of Quebec, or the other colonies or plantations in North America, wheat under 55s. the quarter, is subject to the high duty of 24s. 3d. the quarter; at or above 55s. but under 56s., to the first duty of 24s. 6d.; and at or above 56s., to the second low duty of 6d.; rye, peas, and beans, under 35s. are subject to the high duty of 22s.; at or above 35s. but under 37s., to the first low duty of 11s. 6d.; at or above 37s., to the second low duty of 2d.; barley, bear, or bigg, under 26s. are subject to the high duty of 22s.; at or above 26s. but under 28s., to the first low duty of 1s. 3d.; and at or above 28s., to the second low duty of 3d.; oats under 17s. are subject to pay the duty of 6s. 7d.; at or above 17s. but under 18s., the first low duty of 1s.; and at or above 18s. the second low duty of 2d.; oatmeal, if under 16s. 6d. the bolt of 130 lbs. avoid duty, or 125 lbs. Scotch troy, subject to every bolt to the high duty of 8s.; at or above 16s. 6d. the bolt, but under 17s. 4d. to the first low duty of 1s.; and at or above 17s. 4d. the bolt, to the second low duty of 2d. When imported from any other country abroad, wheat under 63s. the quarter, is subject to pay the high duty of 24s. 3d.; at or above 63s. but under 66s. the bolt of 120 lbs. avoid duty, or 128 lbs. Scotch troy, subject to every bolt to the high duty of 8s.; at or above 16s. 6d. the bolt, but under 17s. 4d. to the first low duty of 1s.; and at or above 17s. 4d. the bolt, to the second low duty of 2d. When imported from Ireland, the high duty is fixed at 10s.; and in or under 13s. 6d. the bolt of 120 lbs. avoid duty, or 128 lbs. Scotch troy, subject to every bolt to the high duty of 8s.; at or above 16s. 6d. the bolt, but under 17s. 4d. to the first low duty of 1s.; and at or above 17s. 4d. the bolt, to the second low duty of 2d. When imported from any other country abroad, wheat under 63s. the quarter, is subject to pay the high duty of 24s. 3d.; at or above 63s. but under 66s. the bolts of 120 lbs. avoid duty, or 128 lbs. Scotch troy, subject to every bolt to the high duty of 8s.; at or above 16s. 6d. the bolt, but under 17s. 4d. to the first low duty of 1s.; and at or above 17s. 4d. the bolt, to the second low duty of 2d. When imported from Ireland, the high duty is fixed at 10s.; and in or under 13s. 6d. the bolt of 120 lbs. avoid duty, or 128 lbs. Scotch troy, subject to every bolt to the high duty of 8s.; at or above 16s. 6d. the bolt, but under 17s. 4d. to the first low duty of 1s.; and at or above 17s. 4d. the bolt, to the second low duty of 2d.

The third schedule shews the prices to which the scale of bounty attaches on the export of corn, ground corn, flour, or meal, malt, &c. from Ireland, and the prices at which the exportation is prohibited. When exported to any country abroad, wheat at or under 29s. 5d. the barrel British, is allowed a bounty of 3s.; rye, and likewise peas and beans, at or under 29s. 4d., a bounty of 11s. 10d.; barley, bear, or bigg, or malt made from them, at or under 15s., a bounty of 1s. 5d.; oats, at or under 10s. 2d., a bounty of 12s. 3d.; wheat flour, biefinn, &c. a bounty of 1s. 6d. the cwt.; wheat meal, 1s. 3d. the cwt.; rye meal, or flour, 9d. the cwt.; barley, bear, or bigg flour, 10d. the cwt.; and oatmeal 1s. the cwt. The price of the wheat exceeds 3s. 1d. the barrel, British; of rye, peas, and beans 22s. 3d.; of barley, bear, or bigg, or malt made from them, 17s. 8d.; and of oats 12s. 3d.; no exportation is permitted.

The fourth schedule shews the prices according to which high or low duties are to take place on importation into Ireland.

By the act of the 45 Geo. III. c. 26. sect. 1, passed in 1805, for much of the act of the 41 Geo. III. c. 36, as may enable the lord lieutenant of Ireland to prohibit the exportation from it for a limited time, to as not to endure longer than the expiration of six weeks, after the commencement of the next session of parliament, corn, potatoes, and all other the provisions whatever, and to permit the importation of corn, &c. for such limited time, without the payment of duty, and the said act to be further continued in force until the 25th day of March 1806.

The act of the 16th July 1806, 46 Geo. III. c. 97. which is intituled, "An Act to permit the free interchange of every species of Corn between Great Britain and Ireland," enables the bounty and duties payable on exportation and importation of all corn and grain, meal, flour, bread, or biscuit, from Great Britain into any port or place of Ireland, or from Ireland, into any port or place of Great Britain, shall cease and determine. Provided always that the person exporting such articles declare before the chief officer of the customs that the corn, &c. is really intended to be exported to Great Britain or Ireland, as the case may be, on which certificates, &c. are to be given to the exporter as in other cases of transmigrant goods coastways, without any fee or perquisite.

And by an act of the 15th February, 1807, the 47 Geo. III. c. 7. the above recited act is amended, it being enacted that the said act, and the several clauses and provisions therein mentioned, concerning the exportation and importation of any sort of grain or corn, meal, flour, bread, or biscuit, from Great Britain to Ireland, or from Ireland to Great Britain was intended to extend, and is hereby declared to extend only to such corn or grain, meal, flour, bread, or biscuit, as is the growth, produce, or manufacture of Great Britain or Ireland respectively, and not to such being the growth, produce, or manufacture of any other country or place.

It is observed by Mr. Mackie, in his excellent "Letters on the Corn Laws," after quoting many judicious amendments in the act of 1791, that the power of the crown in suspending these laws without the consent of parliament is a highly dangerous power, which renders them in some measure of no effect. He conceives that in all free countries agriculture, which is an object of the greatest national importance, should constantly be under the sacred protection of standing laws, left the cultivators of the soil should not have their industry sufficiently encouraged. And that at present, however deficient the cultivation of corn had formerly been, when capitalists were always ready and on the watch to open the ports, and speculate in the introduction of grain from abroad, importation should never be permitted but with the greatest precaution, nor exportation put a stop to contrary to the established laws, except in cases of absolute necessity, when indemnity would be readily granted. Some method of counteracting this and other inconveniences of a similar kind he conceives to be essential. From the barriers which had been formerly set up, as a preventative of the importation of corn from abroad, being destroyed, by the repeal of the old laws and reducing the import duties, a change made by the law of the year 1773, has arisen, he conceives, the inability of Great Britain to supply herself with corn the produce of her own soil.

"In proportion," says he, "as the country advanced in prosperity,
CORN.

prosperity, the surplus quantity, after supplying the inhabitants, which used formerly to be exported, was gradually absorbed by the increasing population and luxury of the nation; and the law in question, among other causes, giving a check to the further extension of agriculture, necessary to counterbalance the additional consumption, the tide at last turned against the country, and a regular influx of foreign grain became expedient to supply the growing wants of the inhabitants."

The differences which took place in this way, are strikingly thrown in the statement given below from Mr. D'rom, who remarks that no accounts have been preferred concerning the exports and imports of corn, previously to 1697, or that, from the high duties, little trade of this nature was carried on; but that in the years from that period to 1700 inclusive, the amount of the exportation of the different sorts of grain was 331,223 quarters; while the importation was only 8,048 quarters; that, in the course of the ten years from the last of the above periods to 1710, the amount of the annual exportation was 24,945 quarters; while the average of the importation only came to 442 quarters. That in one of these years (1709) more than half a million of quarters, and in the course of the whole, not less than 2,849,446 quarters were exported, while only 4,442 quarters were imported.

In the next ten years, from 1711 to 1720 inclusive, the average yearly exportation increased to 449,193 quarters; the average annual importation being only 71 quarters. The amount of the exportation of these ten years being nearly in a double proportion to that of the preceding ten, amounting to 4,491,933 quarters; while the import was only 714 quarters.

In the subsequent ten years, from 1721 to 1730 inclusive, though from different circumstances, much foreign grain was introduced in some of the years, the exports kept nearly up to the preceding equal period; the amount of the whole of them for these ten years being 4,479,683 quarters; the imports of the different kinds of grain being 733,592 quarters.

For the ten years, from 1731 to 1740 inclusive, the act of 1729 having given a check to foreign importation and promoted cultivation, the average annual exportation was 549,447 quarters; while the amount of the average importation was only 4,690; the whole export of the ten years being 5,494,471 quarters; and the whole import only 46,889 quarters.

For the ten years from 1741 to 1750 inclusive, on account of the great industry and exertion of the farmers, in consequence of being released from prohibitory and injudicious laws, the annual average amount of exportation rose to the extraordinary height of 8,486,662 quarters; while the imports amounted only to 15,193 quarters. The exports in 1748 were 1,123,653 quarters, in 1749, 1,250,366 quarters, and in the following year the amazing amount of 1,697,778 quarters; the whole for the ten years being 8,486,662 quarters; while the imports of the several sorts of grain were only 159,437 quarters.

But for the ten years from 1751 to 1760 inclusive, the exports declined, on the average, to 582,837 quarters; the imports, on the average, being 37,357 quarters. This reduction in the exports is supposed to have depended on the deficient crops of 1756 and that of the following year.

From about this period the commencement of the import system seems to have taken its rise, which has since been carried to such an amazing extent.

The imports of the years 1763 and 1764 chiefly consisted of oats; but in 1765 they were different sorts of foreign grain, chiefly wheat, amounting to 218,031 quarters; while the exports of the several sorts of corn amounted to the extent of 457,730 quarters. In 1767 the vast amount of 927,420 quarters was imported, 500,000 of which were wheat; and on the average of the twelve years, from 1761 to 1772 inclusive, the annual exportation had sunk to 370,703, the yearly importation having increased to 231,279 quarters.

Under the sanction of the act of 1773, in 1774 the large amount of 926,174 quarters of grain were imported from abroad, one third being wheat or wheat flour; while the quantity exported was not more than 51,269. In 1775 the immense quantity of 1,151,457 quarters of foreign corn was imported, half of which being wheat and wheat flour, while the exportation only rose to 150,007 quarters. On the whole, for the twelve years from 1773 to 1784 inclusive, the annual average importation came up to 578,358 quarters; while the exportation decreased to 267,152 quarters. The whole importation of this period being not less than 6,486,293 quarters of foreign grain; while only 3,206,184 quarters of grain of home growth were exported.

This reverie of our corn trade, with the vast advantages which are afterwards by it to the nation, are still further shown by Mr. M'Kie in the table of the exports and imports of all sorts of grain, sent from or brought into Great Britain, from the conclusion of the above period to the year 1793.

ACCOUNT
## ACCOUNT of Exports and Imports of Corn into Great Britain, from 5th January 1785, to 5th January 1793.

### Great Britain, Dr.

<table>
<thead>
<tr>
<th>Years</th>
<th>Quarters</th>
<th>Price</th>
<th>Quarters</th>
<th>Price</th>
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</thead>
<tbody>
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<td>1786</td>
<td>132,685</td>
</tr>
<tr>
<td>1786</td>
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<td>1787</td>
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<td>429,407</td>
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<td></td>
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</tr>
<tr>
<td>1792</td>
<td>71,131</td>
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</tr>
<tr>
<td>1792</td>
<td>45,611</td>
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<tr>
<td>1793</td>
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<tr>
<td>1793</td>
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Average price of the above 9 years 43s. 9d.

### Great Britain, Cr.

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<th>Quarters</th>
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<tr>
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<td>11,479</td>
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<td>212,841</td>
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<tr>
<td>1789</td>
<td>12,295</td>
<td>22   10</td>
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<tr>
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<td>1790</td>
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</tr>
<tr>
<td>1791</td>
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<td>1791</td>
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<td>1793</td>
<td>1,394,185</td>
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</tbody>
</table>

Average price of the above 9 years 25s.
Balance received by Great Britain in above 9 years for barley exported or per annum 82,199½ qrs. 78,227 l. 4s. 5½ d.

AC.
ACCOUNT of Exports and Imports of Corn into Great Britain, from 5th January 1785, to 5th January 1793.

<table>
<thead>
<tr>
<th>Great Britain, Dr.</th>
<th>Quarters</th>
<th>Price</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>28,764 s. 28 d.</td>
<td>13,163 s. 28 d.</td>
<td></td>
</tr>
<tr>
<td>1786</td>
<td>3,641 s. 10 d.</td>
<td>6,736 s. 27 d.</td>
<td></td>
</tr>
<tr>
<td>1787</td>
<td>7,051 s. 7 d.</td>
<td>12,683 s. 27 d.</td>
<td></td>
</tr>
<tr>
<td>1788</td>
<td>7,870 s. 5 d.</td>
<td>31,320 s. 27 d.</td>
<td></td>
</tr>
<tr>
<td>1789</td>
<td>18,484 s. 5 d.</td>
<td>39,440 s. 5 d.</td>
<td></td>
</tr>
<tr>
<td>1790</td>
<td>21,638 s. 5 d.</td>
<td>47,340 s. 5 d.</td>
<td></td>
</tr>
<tr>
<td>1791</td>
<td>56,178 s. 1 d.</td>
<td>3,528 s. 1 d.</td>
<td></td>
</tr>
<tr>
<td>1792</td>
<td>13,027 s. 10 d.</td>
<td>16,151 s. 10 d.</td>
<td></td>
</tr>
<tr>
<td>1793</td>
<td>158,934 s. 10 d.</td>
<td>213,368 s. 10 d.</td>
<td></td>
</tr>
</tbody>
</table>

Average price of the above years, 50 a. 11. 11.

Balance paid by Great Britain, in the above 9 years, for rye imported, being per annum for 2947½ qrs. 448½l. 17s. 6d.

<table>
<thead>
<tr>
<th>Great Britain, Cr.</th>
<th>Quarters</th>
<th>Price</th>
<th>Dr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>1,683 s. 3 d.</td>
<td>39,024 s. 3 d.</td>
<td></td>
</tr>
<tr>
<td>1786</td>
<td>13,163 s. 28 d.</td>
<td>12,683 s. 27 d.</td>
<td></td>
</tr>
<tr>
<td>1787</td>
<td>31,320 s. 27 d.</td>
<td>39,440 s. 5 d.</td>
<td></td>
</tr>
<tr>
<td>1788</td>
<td>47,340 s. 5 d.</td>
<td>3,528 s. 1 d.</td>
<td></td>
</tr>
<tr>
<td>1789</td>
<td>16,151 s. 10 d.</td>
<td>213,368 s. 10 d.</td>
<td></td>
</tr>
<tr>
<td>1790</td>
<td>3,528 s. 1 d.</td>
<td>16,151 s. 10 d.</td>
<td></td>
</tr>
<tr>
<td>1791</td>
<td>213,368 s. 10 d.</td>
<td>158,934 s. 10 d.</td>
<td></td>
</tr>
</tbody>
</table>

Average price of the above 9 years, 35 a. 33. 11.

Balance paid by Great Britain, in the above 9 years, for peas and beans imported, being per annum for 111,724 gns. 17½ d. 6s. 10d.

<table>
<thead>
<tr>
<th>Great Britain, Dr.</th>
<th>Quarters</th>
<th>Price</th>
<th>Cr.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>16,843 s. 8 d.</td>
<td>15,994 s. 8 d.</td>
<td></td>
</tr>
<tr>
<td>1786</td>
<td>35,706 s. 2 d.</td>
<td>18,029 s. 3 d.</td>
<td></td>
</tr>
<tr>
<td>1787</td>
<td>42,882 s. 1 d.</td>
<td>18,269 s. 1 d.</td>
<td></td>
</tr>
<tr>
<td>1788</td>
<td>12,902 s. 7 d.</td>
<td>15,135 s. 7 d.</td>
<td></td>
</tr>
<tr>
<td>1789</td>
<td>43,165 s. 10 d.</td>
<td>27,860 s. 9 d.</td>
<td></td>
</tr>
<tr>
<td>1790</td>
<td>14,726 s. 6 d.</td>
<td>17,577 s. 3 d.</td>
<td></td>
</tr>
<tr>
<td>1791</td>
<td>43,590 s. 4 d.</td>
<td>13,721 s. 3 d.</td>
<td></td>
</tr>
<tr>
<td>1792</td>
<td>48,274 s. 3 d.</td>
<td>17,291 s. 3 d.</td>
<td></td>
</tr>
</tbody>
</table>

Average price of the above 9 years, 38 a. 62. 6.

Balance paid by Great Britain, in the above 9 years, for peas and beans imported, being per annum for 111,172½ gns. 17,394 l. 6s. 10d.
### ACCOUNT of Exports and Imports of Corn into Great Britain, from January 5th 1785, to January 5th 1793.

**Great Britain, Dr.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarters</th>
<th>Price</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>To foreign oats imported</td>
<td>27,488</td>
<td>17</td>
<td>2</td>
<td>235,259</td>
</tr>
<tr>
<td>1786</td>
<td>47,847</td>
<td>13</td>
<td>8</td>
<td>430,625</td>
<td>14</td>
</tr>
<tr>
<td>1787</td>
<td>512,002</td>
<td>16</td>
<td>0</td>
<td>426,650</td>
<td>0</td>
</tr>
<tr>
<td>1788</td>
<td>413,817</td>
<td>16</td>
<td>0</td>
<td>318,314</td>
<td>12</td>
</tr>
<tr>
<td>1789</td>
<td>426,723</td>
<td>16</td>
<td>0</td>
<td>343,777</td>
<td>12</td>
</tr>
<tr>
<td>1790</td>
<td>735,713</td>
<td>18</td>
<td>10</td>
<td>692,282</td>
<td>18</td>
</tr>
<tr>
<td>1791</td>
<td>788,785</td>
<td>18</td>
<td>2</td>
<td>716,410</td>
<td>13</td>
</tr>
<tr>
<td>1792</td>
<td>1,084,401</td>
<td>18</td>
<td>2</td>
<td>911,564</td>
<td>4</td>
</tr>
<tr>
<td>1793</td>
<td>Average price of the above 9 years</td>
<td>777,533</td>
<td>21</td>
<td>10</td>
<td>788,754</td>
</tr>
</tbody>
</table>

**Quarters | Price | £ | s. | d.**
| 1785 | By oats exported | 25 | 273 | 17 | 2 | 234,907 | 13 | 2 |
| 1786 | 19 | 9 | 18 | 0 | 17,380 | 16 | 0 |
| 1787 | 17,608 | 18 | 8 | 13,933 | 18 | 1 |
| 1788 | 11,418 | 15 | 8 | 11,294 | 2 | 0 |
| 1789 | 32,683 | 16 | 0 | 26,149 | 8 | 0 |
| 1790 | 14,375 | 18 | 10 | 13,422 | 5 | 10 |
| 1791 | 16,358 | 18 | 2 | 11,538 | 10 | 4 |
| 1792 | 25,786 | 18 | 2 | 23,352 | 6 | 10 |
| 1793 | 17,473 | 17 | 10 | 15,974 | 13 | 10 |

**Balance paid by Great Britain, in the above 9 years, for oats imported, being per annum for 375,593,9 quintals, 522,456 lbs. 3 d.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarters</th>
<th>Price</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>181,580</td>
<td>17</td>
<td>10</td>
<td>161,090</td>
<td>14</td>
</tr>
<tr>
<td>1786</td>
<td>479,408</td>
<td>12</td>
<td>3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**GENERAL Account of the Exports and Imports of Corn from and into Great Britain for 9 Years, from 1785 to 1793 inclusive.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarters</th>
<th>Price</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>To foreign wheat imported from 1785 to 1793</td>
<td>1,635,305</td>
<td>3,740,760</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>1786</td>
<td>To barley ditto</td>
<td>553,552</td>
<td>691,940</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>1787</td>
<td>To rye ditto</td>
<td>150,514</td>
<td>236,866</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td>1788</td>
<td>To peas and beans ditto</td>
<td>236,126</td>
<td>308,662</td>
<td>6</td>
<td>5</td>
</tr>
<tr>
<td>1789</td>
<td>To oats ditto</td>
<td>5,362,921</td>
<td>4,863,559</td>
<td>6</td>
<td>4</td>
</tr>
<tr>
<td>1790</td>
<td>7,938,418</td>
<td>9,921,190</td>
<td>6</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>

**Quarters | Price | £ | s. | d.**
| 1785 | By wheat exported from 1785 to 1793 | 1,193,125 | 2,980,365 | 3 | 0 |
| 1786 | By barley ditto | 1,115,348 | 1,394,185 | 0 | 0 |
| 1787 | By rye ditto | 123,986 | 186,495 | 12 | 2 |
| 1788 | By peas and beans ditto | 155,571 | 241,783 | 5 | 3 |
| 1789 | By oats ditto | 183,580 | 161,900 | 14 | 1 |
| 1790 | 5,077,668 | 4,972,608 | 12 | 3 |
| 1791 | 5,077,668 | 4,972,608 | 12 | 3 |

**By surplus quantity of grain imported by Great Britain, in the 9 years above-mentioned, after deducting the quantity exported, being at the rate of 364,185 gns., 3 value 550,750 l. per annum.**

<table>
<thead>
<tr>
<th>Year</th>
<th>Quarters</th>
<th>Price</th>
<th>£</th>
<th>s.</th>
<th>d.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1785</td>
<td>18,938</td>
<td>2,021,190</td>
<td>6</td>
<td>5</td>
<td></td>
</tr>
</tbody>
</table>
The same writer, after observing that the act of 1791 in some degree discouraged the importation of corn from abroad, by increasing the rates or duties on it, which was a defect in the old laws, yet still that statute is far from a state of perfection. A radical error had, he conceives, been committed in the outfit of the corn laws, which has never been removed, which is that of the relative regulating rates of exportation and importation for the different kinds of grain, not having been fixed for such, proportionately to their real values, the labour and expense they stand the farmer in raising and bringing to market, as in such instances he would be under the necessity of relinquishing the cultivation of any particular fort of grain, fo rated from the corn dealer, in consequence being able to have almost a complete command of the home market, from his being capable of supplying it from abroad. This he contends is the case at present in regard to oats, as from various statements he shews, that if the rate of importation for that fort of grain had been regulated originally, "in proportion to the current values in 1670 and 1688, when the present sytem of corn laws was firstrafted," it should have been in the following proportion. "As 25s., the average price of wheat is to 83s. 4d., the import rate of wheat including the duty, fo is 12s., the average price of oats, to 30s. 6d., being the relative import rate at which oats ought to have been imported, including the duty; whereas the law allowed foreign oats to be imported at 17s. 4d. including the duty. This he shews to have continued till the cale with this fort of grain, from which the culture has been greatly abandoned by our farmers; and a large importation of that fort of corn, though much inferior to our own, rendered necessary, 5,362,921 quarters having been imported from 1785 to 1791 at the value of 4,985,399l. 6s. 4d.

It is concluded on the whole, that as the "wealth of nations varies considerably at different times, so ought the rates which regulate the export and import of foreign corn; if these affect the money price of our own produce in the home market, and tend to sink its relative value below the present price of labour, with which it must always bear a just and necessary proportion, the rates must consequently be raised in order to preserve agriculture, the only solid basis on which the real wealth and lalling prosperity of a state can be founded." Should our industry and capital continue to increase for thirty years, in the same ratio it has done since the peace of 1783, the money in circulation, the price of labour, and the expense of cultivation may be double what it now is; and the price of corn will naturally increase in the same degree: should the rates, at which corn from abroad is then permitted to be imported, have a tendency to obstruct such a rise, he contends, that they must either be heightened or this country will lose its agriculture, as has already happened in the case of oats; but that, on the other hand, should the prosperity of the country decline, fo as to lessen the demand for labour, or the floating capital to one-half, the price of corn should sink in the same proportion, to the diminished price of labour, and the import rates be lowered, if the means of preventing such a necessary diminution. Consequently, that, if these principles be well founded, a permanent law for the regulation of the export and import of grain, is inconsistent with fair policy; it should be such as to expire regularly at fixed periods, according to the wisdom of the legislature, on taking the situation of the country into full consideration, so as to regulate it in conformity to the price of labour, which is "the most certain index of the growing prosperity, stationary situation, or declining state of the nation."

In support of which Mr. Malpue, in his late work Vol. IX.

CORN.

in order "to reforge our independence, and build our national greatness and commercial prosperity on the sure foundation of agriculture, it is evidently not sufficient to propose premiums for tillage, to cultivate this or that waste, or even to pass a general inclosure bill, though these are all excellent as far as they go. If the increase of the commercial population keep pace with these efforts, we shall only be where we were before, with regard to the necessity of importation. The object required is, to alter the relative proportion between the commercial and the agricultural population of the country, which, he thinks, can only be done by force of syll:n, that will determine a greater proportion of the national capital to the national land." And he "fees no other way at present of effecting this object, but by corn laws adapted to the peculiar circumstances of the country, and the rate of foreign markets." These are stated as the leading principles and circumstances which are necessary to be particularly had in view in the framing of laws for the regulation of the trade in corn.

CORN, in Surgery, is a hard, dry, cuticular, warty, or horny induration in the skin, and sometimes also in the subjacent cellular membrane. In the former case, the induration may be moved backwards and forwards; but in the latter, it is immovable. Corns are in general not larger than about the size of a small pea, and are produced in consequence of external pressure, especially in such parts as are exposed to much friction, and where the skin is very near to the bone. They are, therefore, most generally found in the toes, or the soles of the feet; but sometimes also in other parts, as on the upper ridge of the hip bone, where they are produced by the pressure of women's stays. Sometimes also similar induations are formed in the ears of women, who wear heavy ear-rings. When they are formed in the feet, they generally arise from the use of too narrow or high-heeled shoes, and sometimes merely by wearing the stockings too tight. Frequently they produce no inconvenience; but sometimes they become so painful as to render the patient entirely lame. The pain is increased by wearing warm stockings, tight shoes, violent motion of the body, itching or walking too long, drinking spirituous liquors, and during variable weather. They are generally painful in hot weather, but rarely so in cold.

With respect to the cure, the surgeon may either endeavour to remove the pain for a time, or radically to free the patient from the disease. The violence of the pain may be immediately relieved, by the patient's sitting down, taking off his narrow shoes, placing his foot in a horizontal position, and cooling it a little. A more permanent relief may be obtained, by having off the prominent part of the corn with a knife, as far as it can conveniently be got at, without, however, exciting any hemorrhage, and by the use of emollient warm fomentations. The patient cannot be radically freed from his corn, unless he resolves, during the progress of the cure, to wear no other than wide, soft, and low-heeled shoes, and to walk and stand as little as possible. If this is out of his power, and he is under the necessity of frequently walking or standing for a considerable time, the pressure may be prevented in the following manner: Take a piece of linen spread with some emollient plaster; lay one piece over another, from eight to twelve times together, and cut a hole in the middle of them, exactly the same size and circumference as the corn; then apply it in such a manner that the corn enters the hole in the plaster, and is thus defended against the contact of the stockings and shoes. When such a plaster has been worn for the space of some weeks, the corn, if recent, generally disappears without requiring any other
other remedy. When the corn is situated in the sole of the foot, we need only cut a hole into a felt-sole, so as to fit the corn, and introduce it into the shoe.

By the following treatment, corns may be removed with certainty, radically, and speedily, especially if we employ at the same time the perforated sole or plater: Rub two or three times a day an emollient liniment, such as the ointment of althea, or, which is still better, the volatile liniment, upon the corn, and keep it covered during the intervals with an emollient plaster. Every morning and evening let the foot be kept for half an hour in warm water, and the corn well rubbed with soap. Let the external part of the corn, which will have become perfectly white, soft, and pulpy, be then scraped with a blunt knife, till all the soft part is removed, and till the operation begins to give pain to the patient; upon which, we must immediately desist. This treatment is to be continued till the corn is entirely extirpated; for if we deal from it earlier, the corn will grow again. However, we must take care not to cut the part with the knife, so as to make it give pain or bleed.

Amongst a variety of remedies that have been recommended for corns, the following are the principal: green wax, soap plater, diacition, or hemlock plater, a piece of bacon, the juicy pulp of a fresh lemon, and even a piece of green oil-cloth, &c. which are to be changed as often as may be necessary. The following remedies have also been recommended as infallible: R Gummi, ammoniac. Cen.citri. aa 3 j Aeg. aeris 5 j. M. F. Empl. S. To be spread upon linen and applied to the corn. Or. R Empl. de gabano, de ammoniac, diacition, comp. aa 3 j. Camph. 3 j. M. F. Empl. D. S. To be spread upon linen, and applied to the corn, in pieces just sufficiently large to cover it. In order to aid the operation of the remedy, we may previously soften the corn in warm water, and scrape off as much of it as we are able. The following platter has been laid to produce the lepuration of the corn within three or four days: R Gummi, galban. 3 j in acetoe diffluent, & ad fpfliudinem evaporat. Add. Picae navic 3 j. Empl. diach. flmpl. 5 j. In fine, Sni. ammon, virid. Aeris pulvertis. aa 3 j. M. F. Empl. The excision of the corn is not to be recommended as a radical method of cure, both on account of the difficulty and danger with which it is attended, and because it sometimes proves unsuccessfull. When the patient has got rid of his corns, he must avoid all the above-mentioned causes which tend to produce them, or they will again return.

Corns, in Veterinary Science, a troublesome disease in the feet of horses, most generally occurring in the fore feet, and in the inside heel, within the angle or union of the quarter with the bar; though these bruises are sometimes found in both quarters or sides of the foot.

Terms improperly used in any art or science render its access more difficult, obscure our views of it, and retard its advancement: To the term corns is, in this case, a gross misapplication of words, creating perplexity and misconception, and which actual experience in the disease is hardly sufficient to do away.

When the skin of the human foot is gradually compressed or rubbed, without any sudden and violent irritation that shall raise the cuticle or create a force, it thickens first, then becomes horny, and is rightly enough termed a corn, from cornus. Lat. or cornus. Fr. horn.

In the horse, on the contrary, whose foot is everywhere thickly clothed with natural horn, such an occurrence, if it were possible, could not be a disease; but if a bruise takes place in the foot, at the point above described, it is also called a corn, though agreeing in nothing with the former disease, but in the common circumstance of its affecting the foot with pain and lameness.

Where a corn, as it is called, exists in the foot, it is known by a redness, more or less intense, in the angle formed by the union of the bar with the sides of the foot, and is most generally observed, as we have already stated, in the inner quarter: it is tender, if pressed upon, producing lameness; and if the irritation is carried far enough, it betters, and the pus, being prevented escaping below by the sole, forms a purulence inside the hoof upwards, through the foliated fibritian or chalic processes, to the coronary; and if a shoe, pressing too hard upon the part, continues to be used, the irritation being kept up for a long time, the part becomes weakened in its function, not forming good found horn, and a painful disease is created, which is eradicated with difficulty, and is liable to recur, after relief has been obtained, by the slightest renewal of this permanent pressure, or of irritation of any kind.

Having briefly described the disease, as it commonly appears, we proceed to consider its cause, and the cure.

As it is unequal pressure that produces corns, even in strong feet, from the shoe bearing too hard upon the point of the foot above indicated; so, in fact naturally weak, a slighter degree of pressure, if the pressure be permanent, shall be sufficient to induce it: so that the disease may be observed in all sorts of feet, but far more frequently in weak ones, as in low heeled feet, or where the heels project very much, and the horn turns under, and is thin.

The horse's foot, we may remark, by being continually bound by the nails which attach the shoe to the foot, is ever hardening and diminishing in its volume, under their influence and pressure, and especially all the elastic parts of the foot, which, not being then called into much action, become inert and rigid, or are absorbed; the posterior parts of the foot, in particular, are damaged by it, and, in its contracting the foot, often forms waving lines of horn, which turn under at the heels, so that the shoe will take its bearing on the parts so disposed, in a direction tending inwards, and bring on bruises and weaknesses, or corns, as the smiths have been pleased to call them.

The inflammation induced by the bruise or pressure occasions an increase, or sometimes rupture, of the blood-veins of the part pressed on, so that instead of lymph, the red parts of the blood flow into them: and hence that redness in the horn of the bruised part, the external indication of this disease.

If the pressure be speedily and effectually removed, and all external irritation be kept away, healthy horn forms again, and the disease disappears; but if the irritation be kept up for any length of time, or has been attended with much violence, the vascular parts go on to suppurate; and the pus, as we have observed, forces its way with great pain to the coronary. Its frequent recurrence leaves the parts very weak, and the smiths are then apt to imagine it is natural to them, and convey this idea to others, and seldom admit the real cause of the disease.

One circumstance, we believe not much understood, it is of importance to dispele here, reflecting the production of this disorder, and which cannot be too generally known and considered, as it may be the means of warning those whose experience has not yet informed them of the danger: it is this, that if we make a perpendicular section of the horse's foot, across the two points of the heel, where the corns usually are found, it will be observed that the outside and inside heels exhibit different appearances: the vascular parts lying much lower on the inside than on the outside quarter; so much so, that any one holding the foot from the ground, and
and levelling the sole to his eye with his drawing-knife or butter, he would meet with the blood of the infinite quarter before he had brought it to what he would conceive the proper level of the outer, and before he had made the foot. For the horse's foot, no doubt for the wickett purposes, is not made a regular cone, as a care's inspection should apprehend it to be, but is placed inclining on the ground, with the inside the highest, forming a species of rhomb or lunezour: the inner parts being thinner in horn, more elastic, and flity; while the outer are flouter in horn, and with less vascular matter, and more adapted for receiving the wear, which, we may observe, takes place primarily on the outer side of the toe or piece, as may be seen by looking at the shoes when taken off, or observing the wear of the natural foot methods; and thus compression and uneasiness are prevented by the greater yielding and elasticity of the inner quarter and the heels: for had the foot been on every side equally unwielding, reflection, compression, and pain, under heavy burdens, or great or long continued exertions of the animal, would have been produced.

It is this difference which may deceive the smith, and make him bring the shoe nearer the quick on this quarter than he intends; and it is the superior elasticity and vascularity of his fore feet that occasions them to be more the subjects of this disease than the hind, where horns rarely occur, and which we have heard the smiths attribute to the.caufe of their flaring with their hind feet in the dung of the stable.

The position, also, in which the smith is obliged to hold the foot between his thighs, turned upwards, and drawn away from the horse outwards, will tend to increase his deception, in regard to these circumstances of the apparent levelling of the hoof; and where there is a weak, low, flitty heel, as it is termed, a slight mistake is sufficient to produce a bruised heel, or corn, which in flouter feet it would be more difficult to do; though in these we sometimes find it has been done.

A shoe too narrow for the foot, or with the heel made very sloping inwards, would also induce a bruise of these parts; for we see, by the brightness of the shoe at this part, after it has been on some time and removed, that the nails do not entirely prevent the motion of the heels on this surface.

Finally, a shoe not equally fitted to bear alike on all the parts of the foot, but bearing on the toe and heels only, especially the inner heel, and not taking sufficient pressure at the quarters, would, by this partiality of pressure, induce inflammation and pain. Clenching the nails too forcibly near the heel, so as to induce more pressure there than at the toe, would also do the same thing. Under the article Farriery, we propose considering some other parts of this subject, having barely infected enough of that branch of the business here as may be laid particularly to belong to this subject.

If this reasoning, therefore, be true, the corn arises from the weakness and insufficiency of the foot to bear the pressure of a nailed shoe, or from partial and ill disposed pressure in the strong feet, or improper pairing: therefore the ancients, who, we believe, knew nothing of this nail shoeing, had not their horses subject to this disease; and such, on examining their writings, turns out to be the fact: for though they have described, and often most truly, the diseaees of the horse, they have not described this disease, so as for us to conclude on its identity. The "Pulmiculmus ad apertum" of Vegetius, lib. ii. cap. 56. has some of the characters of the corn; but it is not clear whether oxen or horses were the objects of it, and he recommends uns-of

ing for it: whatever it is, it was probably a disease arising from a weak heel, which, by long journeys or rough roads, might be so bruised as to bring on similar consequences.

Having treated of the appearance of the corn and its causes, we have now to consider the remedy, first observing that prevention from it is ever the wickett line of conduct, especially in a disease where the mechanical causes of it are obvious, and can be prevented. Where the corn or bruised heel has taken place, the name and molt is general fogestion is to remove the shoe, and take away all the tissue escaped horn with the drawing knife, so as, on the re-application of the shoe, to remove all pressure from the part, and thus admit a new growth of horn not subject to external pressure. For this purpose, the horse may be turned to graze during its growth, when in general it will grow down apparently perfect: it is, however, if the disease has been of any duration, too apt to return, if the smith brings only the ordinary pressure of a shoe upon it; though this takes place by degrees, and not at the first shoeing; the parts weakened by the disease become unable to sustain even this pressure, and first become tender, and afterwards lame; or the parts feter, according to the degree of it. The barred shoe, on this account, is often had recourse to by the smiths with good success; the pressure to the corn being done away by the parts of the shoe opposite: it being bent out of the line of plane of the shoe, and then to the foot, a light floating of turpentine dailings on sawd is applied, and boxed in with tar clove. The continuance of this, which is seldom prilled in long enough, Religion the horn to progress, which being then left off, and the ordinary shoe applied, induces again the consequences, sooner or later, that we have described.

A shoe may be beat or filed out with a space opposite the corn; but we have found it more easy and certain, when the parts are arrived at this state, to make a shoe rather thicker than the ordinary shoe, and to cut off entirely that extremity of it that comes opposite the corn, to a short distance from it, so as to be affluce no pressure can arise from the shoe itself; for if the shoe be left long, however managed, by long wear it is apt to play and become relaxed, from the parts both of the hoof and shoe giving way to each other, and thus creating a degree of looseness, when the heel of the shoe, coming upon the part, reproduces the disease. It will be objected to this proposal, that the corn is left unprotected, and at first it will be a little tender, but this will speedily go off, and at each shaving will become of less consequence; and it is better of the two evils to contend with the occurrence of accidental pressure from irregularities in the rand, than the perpetual pressure of the shoe. In flight cases, after the shoe has been nailed on pretty firmly, we have taken a small saw, and sawed away the horn rolling on the shoe at this part, so as to make it press less there than on any other part of the foot; but if the shoe be allowed to play on too long, the nails, as we before stated, become relaxed, by the horn giving way, and pressure will occasionally take place on the corn.

Of late we have had several opportunities of using the shoe above described, and have found it in practice beyond our expectation; nor have we found it, though awkwardly imperfect, produce any of the evils we had apprehended it would be subject to. There are other methods than those we have described, but we do not mention them, from finding them insufficient. Where pus has formed, the horn covering it being effectively removed, digestive of turpentine are used, as in any other wound, till the healing of the sore takes place, when the cause that originally produced it must be carefully avoided.

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Corn.
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Corn-Bottle, in Agriculture. See Centaury and Weed.

Corn-Butterfly, in Entomology. See Papilio.

Corn-Crowfoot, in Agriculture, is the common name of a plant of the weed kind, often found among corn crops, and which is very troublesome to the farmer. It has an upright stem, with pale green leaves, cut into long narrow acute segments; the flowers are of a pale colour. It is extremely difficult to eradicate from places where it is established. See Weed.

Corn, Ear of, in Natural History. Under this name different authors have described a variety of organic remains found in the strata of the earth. M. Schleicher, in particular, gives the figure of a foil, which he describes as an ear of corn, and from its figure, and suppos'd fulness, he argues, that the Mosaic deluge took place in the month of May! But Mr. Walsh considers this body rather as a zoo-phyle, the rays of which are divided by transverse lines, marking their separation into distinct vertebrae.

The Spica fœcalina, and granimis panicul of Dr. Richardson, the ear of barley which Mylius has figured, are of like doubtful origin; the latter, in particular, does not bear the proportions of an ear of barley.

The flange-gruppen of the German mineralogists more nearly resemble ears of corn, than the above. These are flat, oblong, blackish, and sometimes greenish bodies; but, becoming white, and acquiring a metallic lustre on their prominent parts by friction. Many have supposed these to be mineral substances, to which mere accident has given their present form; but they seem to be real vegetable substances, impregnated with metallic particles. They vary considerably in form, but are in general flattened, and are fluted with little round prominences, bearing very much the appearance of corn. They are found but very rarely, and perhaps only in the copper mines of Frankenburg in Hesse. M. Lihman, who has written expressly on these substances, does not consider them as changed vegetable substances, but as being of mineral origin; he found them to consist of copper, arsenic, sulphur, and iron, with a small quantity of silver in their composition. Wolfart, who has delineated and described these substances, calls them frumenti metallica, acknowledging that he cannot refer them to any particular species of grain. Mr. Parkinson gives two figures of these substances, but concludes his description thus: "I am therefore of opinion, that we must be satisfied with considering them as foils, whose origin must be referred to some hitherto unknown subject of the vegetable kingdom." M. Whitechurch, "Theory of the Earth," p. 169 mentions corn among the vegetable impressions found in the coal measures of Derbyshire; but this is doubtful as it was founded as any of the foregoing; and we have the best reason to suppose, that minute and scientific examinations will place all these among the incognata of a former state of aquatic existence.

Corn-Brush, in Agriculture, is that sort of brush which is principally cultivated and conducted under the system of corn, or the chief produce of which is grain. All the more dry sorts of land are adapted to this purpose. See Corn and Farm.

Corn-Flag, in Botany. See Gladiolus.

Corn-Flag, in Agriculture, is the name of a troublesome plant of the weed kind, which increases greatly by the root; when established in the field, it is with difficulty extinguished, as it is capable of sending up new plants from every part of its roots. See Weed.

Corn, Indian. See Indian Corn and Maize.

Corn Land, that kind of land which is adapted to the growth of grain. See Farm.

Corn, Lent, is a term applied to that sort of grain which is usually sown, or put into the soil about that season.

Corn, Marygold, is the name of a plant of the weed kind, of which there are two species, one found commonly in arable land, and the other in the fatness of the more moist kind. It is a great enemy to all sorts of corn crops. It is estimated with much difficulty, as it multiplies both by its roots and seeds. Deep and effective hoeings, frequently repeated, are of course requisite, before it runs up to seed. See Weed.

Corn Measure, in Rural Economy, that sort of measure which is used for grain. See Measure, and Weights and Measures.

Corn Mill, that sort of mill which is employed in the grinding of corn. See Mill.

Corn Parsley, in Agriculture, is the name of a low branching plant of the weed kind, often met with among corn crops. See Weed.

Corn Rent, that sort of rent which is regulated by the price of grain. See Rent.

Corn-Rent, in Law, denote those third parts of the old rents on college legacies, which are to be reserved by the legatees. Stat. 18 Eliz. cap. 6. These were the invention of lord-treasurer Burlig, and Sir Thomas Smith, then principal secretary of state, for upholing the revenues of colleges.

These great statesmen, observing how much the value of money had fell, and the price of all provisions risen, by the quantity of bullion imported from the new-found Indies, which effects were likely further to increase, devised this method. Their foresight and penetration have in this respect been very apparent; for though the rent so reserved in corn was at first but one-third of the old rent, or half of what was still reserved in money, yet now the proportion is nearly inverted; and the money arising from corn rents is, communis annis, almost double to the rents reserved in money.

Corn-Rocket, in Botany. See Bunias.

Corn-Sallad, in Agriculture, a species of the Valerian. See Valerian.

Corn-Sharpen. See Sharpening.

Corn, Spring, a term signifying such sorts of grain as are put into the earth in the spring season.

Corn-Stand. See Stand.

Corn-Stubble, that sort of fluff which remains after reaping or cutting any sort of grain crop. It should constantly be collected for the purpose of litter. See Stubble.

Corn-Stubble Rake, is a large kind of horse-rake, employed in some counties with much benefit. See Rake.

Corn-Straw. See True-corn.

Corn-violet. See Weed.

Corn, white, a general term used to signify all sorts of grain.

Corn-Weed, a sort of insect of the caterpillar kind, which is said to be very detrimental to corn.

CORNA, in Ancient Geography, an episcopal town of Asia, in Lycaonia, mentioned in the Acts of the council of Chalcedon, held in 451.

CORNA, in Geography, a town of Arafian Turkey, in the Arabian Irak, on the Euphrates; 6 miles N. W. of Baffor.

CORNACHINE Powder, in Pharmacy, a purging powder,
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oder, called also 'evil of Warwick's powder, and pulvis de tribus. It is composed of equal parts of antimonium diatomicum, digrydium, and cream of tartar.

CORNACHINI, Thomas, in Biography, born at Aries, in Tuscany, about the middle of the 16th century, obtained considerable celebrity, as professor of medicine at Pisa, where he lectured to large audiences several years. He died in 1555, and was succeeded in the professorship by his son Mark, who published at Venice, in 1607, in fol. "Tabulae Medicæ," the only work left by his father, in which he has collected the descriptions and accounts of diseases left by the Greek and Arabian physicians, with commentaries upon them. His son had the credit of giving his name to a purging powder, Pulvis Cornachini, consisting of calomel, a SS. Members, and burnt hairhorn, which still retains its credit, for its efficacy in destroying the atherides, a small worm, infecting the bowels of children. Mark also published, "De Homini GENERATIONE, de Vino, et Aqua, balneaticis Pufianis," Frankfort, 1667, fol. and a "Discovery on the Method of Curing, tuto, et juvando," he says, all those diseases, which are said to be derived from peccant humour. Haller Bib. Med. Elov. Diet. Hist.

CORNACUM, in Ancient Geography, a town of Lower Pannonia, according to Ptolemy and Antonine's Itinerary. CORNAGNE, an ancient tenure, the service whereof was to blow a horn, when any invasion of the Scots was perceived.

This tenure, which was a species of grand fealty, was very frequent in the northern counties, near the Picts and the Roman walls; but by lat. 12 Car. II. all tenures are converted into free, and common foggage.

An old rental calls cornage, newgold, q. d. new gold. Lord Coke says, in old books, it is called homedelg.

CORNARISTI, in Ecclesiastical History, the disciples of Theodore Cornert, an enthusiastic secretary of the states of Holland. He went at the same time against the Catholics, Lutherans, and Calvinists. He maintained that every religious communion needed reformation; but he added, that no person had a right to engage in accomplishing it, without a million supported by privacies. He was also of opinion, that a person might be a good Christian, without being a member of any visible church.

CORNARIUS, John, in Biography, a physician of great eminence, and author of numerous treatises on the theory and practice of medicine, was born at Zwickau, in Upper Saxony, in the year 1500. Haller says, his proper name was Hagenenbot or Hambut, but that following the custom of the time, he took the name of Cornarius, which he affixed to all his publications. He is said to have attached himself to the study of medicine, in the hope of discovering some method, or medicine, capable of restoring, or invigorating his constitution, naturally feeble and delicate. With this view, he resided in succession, at several German universities, and at length at Basle, in Switzerland, where he met with copies of Hippocrates, Aetius, and other of the Greek fathers, in their own language, which he had not before been able to procure. Returning with this treasure to his own country, having previously taken the degree of doctor in medicine at Padua, he set himself down to translate first the works of Hippocrates into Latin, which he completed in five years, and published at Basle, in folio, in 1543; then Aetius, and Paul of Aegina. He had before published, viz. in 1529, "De generi medicé, epigraphico et enumeratione," which has been several times reprinted. "De rebus medicinis literatis ampléctens," "De conviviorum veterum Graecorum," "De pecto libri duo; de Podagrae lusibus," in 1553, with various other dissertations. While thus employed, he did not neglect the practice of medicine, of which he is said to have had a considerable portion. His translations of Hippocrates, having been rudely attacked by Fuchhus, he answered it by a factual effusion, which he called, "Vulpeculae excoriata." This was printed at Frankfort in 1543, in 4to. Fuchhus answered this by a similar piece of satire, Cornarius furious. The translation of Hippocrates has long since been superseded by those of Vander Linden, and Teius, and those of Aetius, and Paulus Ezineta, were not much longer lived. They were however works of great labour, and contributed to lessen the difficulties of the task to those that followed.

Cornarius died at Jena, March 15th, 1558. His son, Diesmede, succeeded to his practice. He was appointed professor of medicine, in the university of Vienna, and physician to the emperor Maximilian II. He published at Leipzic, in 1595, in 4to. "Confiliorum medicinæ tractatus," also "Historia admiranda rariorum medicinarum." Haller Bib. Elov. Diet. Hist.

CORNARO, Francis, cardinal and bishop of Padua, in the sixteenth century, began his career as a military man, during the contests in Italy excited by the rival intertells of Charles V. and Francis I. in which the Venetian republic was involved. Upon a general pacification, he quitted the army and devoted himself to the perusing of literature and the study of politics. He was afterwards fixed upon as ambassador from the republic to the emperor Charles V. In 1547 he was raised to the dignity of cardinal by pope Clement VII. and after his admission into the college, he confined his labours to the deliberations of that body, where his learning and experience were highly appreciated. He died in his sixty-fifth year, A. D. 1543, of the gout, with which he had been long afflicted. Moreri.

CORNARO, George Basil, cardinal and bishop of Padua, was born in 1568. He also began life in the army, which he left for the church. He was member of the order of Malta, and grand prior of Cyprus, an office which was hereditary in his family. His application to literature, and his acquirements by foreign travel, painted him out as a person well and highly qualified to fill offices of great responsibility in the republic. He was first appointed to the superintendancy of the marine, and would have been sent as ambassador to France, had not his preference led him to embrace an ecclesiastical life. He accordingly went to Rome, where he was entrapped with certain commissioins which led him to high preferment and great dignities in the church.

In 1602 he was appointed ambassador to the court of Portugal, and was made titular archbishop of Rhodes. On his return, he was created cardinal by Innocent XII. and nominated to the bishopric of Padua. He died in the year 1722. Moreri.

CORNARO, Lewis, of a noble Venetian family, though from his not enjoying the honors attached to it, he should not to have been legitimate, was born in 1467. He lived to a great age, which he attributed, and probably with justice, to a strict, abstinent regimen, adapted by him, on his recovering from a severe illness, when he was more than forty years of age. His health had been declining several years, prior to this attack, owing as he acknowledges to his living a debauched and voluptuous life. In entering on his new regimen, he took care to avoid, he says, the extremes of heat, or cold, together with all violent exercise, and to live in a moderate dry air; all which, he contended, were equally important in attaining the end proposed, the restitution of a decayed constitution, as temperance and diet. During the remainder of his life, he only took twelve ounces of solid food,
food, wine, bread, fowry, rooks of eggs, and meat, and fourteen ounces of wine in the day. This portion, as he grew old, he rather diminished than increased, observing that the power of conversation is then less vigorous, and, as that weakness, the mind should be inclined. He married a lady of the house of Spillmberg, at Udina, by whom he had an only child, a daughter, when they were both advanced in years. At the age of 83, he wrote his "Siccorti della vita fabria;" a short treatise on the advantages of temperance, from which this account is principally taken. The work has been repeatedly translated, and printed in every country in Europe. He was then, he says, so brisk, lively, and active, that he could mount his horse, without assistance from any rising ground. Sometimes he retired to his villa, seated in a valley, watered by the Brenta, enclosed with large, well-cultivated fields, and a considerable number of buildings, made habitable by his own industry. "It had been full of fens and bugs; he says, a habituation, more fit for flies, toads, and tarantels, than for man." He had the pleasure of enjoying the society of his daughter and eleven grandchildren she had produced; who amused him with their musical exhibitions, in which science as well as in that of architecture, he had no inconsiderable skill. He died at Padua, April 26th, 1566, at the age of 98. His wife, who survived him, lived also to nearly the same age. Sir John Sinclair, in his "Code of health and longevity," mentions the elation of 1779 as the best English translation of Cornaro's works. There are four discourses on one subject, penned at different times; the first, which he wrote at the age of 63, is intituled "A treatise on a sober life," in which he declares war against every kind of intemperance. The second was composed three years after, and contains directions for repairing a bad constitution. The third he wrote when he was 91, intituled "An earnest exhortation to a sober life;" and the last is a letter to Barbaro, patriarch of Aquileia, written when he was 95, which contains a lively description of the health, vigour, and perfect use of all his faculties, which he had the happiness of enjoying at that advanced period of life. Eloy, Dct. Hist. Gen. Biog.

CORNARO-PISCORIA, LUCRETTA HELENA, an illustrious Venetic lady, was born at Venice in 1646. At the age of eleven having imbibed a devotional temper, and an ardent love of literature, she took a vow of chastity, which she maintained through life, though a dispensation was obtained from it, without her knowledge. She was an excellent linguist, being thoroughly conversant with several of the modern languages and with the Latin, the Greek, Hebrew, and Arabic. She had a taste for poetry and music, and composed verses which she sung to her instrument. In many of the abbeys of science she was deeply read, and acquired so much reputation, that it was proposed to give her a seat among the doctors of theology at Padua; this was opposed by the bishop; she was however honoured with a cap of doctor in philosophy. The ceremony used on the occasion was performed in 1678 in the cathedral of Padua, at which an immense concourse of people was assembled as witnesses of so extraordinary a sight. She was elected a member of all the principal literary societies in Italy, and no person of distinction visited the country without paying his respects to this excellent lady. She had a great desire to enter into some religious society; but by the entreaties of her father she remained under his roof, contenting herself with wearing the habit of the Benedictine nuns, and observing the rules of the order. She died in the year 1684, and her works were collected and published in 1689, but their merit is not equal to the high reputation which the author sustained during life. More.

CORNARU, in Geography, a town of Germany, in the circle of Wetphalia, and county of Diopholz; 6 miles N. of Diophoz.

CORNAVI, in Ancient Geography, a people of the isle of Albion, who were situated to the west of the Cornavii or Corn-Isen, in that country, according to Camden, which is now divided into Warwickshire, Worcestershire, Shropshire, and Cheshire. There were several British tribes of this name, in other parts of this island; and particularly in the most northern part of Britain, called Strathavven, which seems to retain some vestige of the name of its first possessors; and they all seem to have been called Cornavi, from the two British words Corn, a horn, and Aven, a river, descriptive of the form and situation of their respective countries. By the Cornavi, there was another British tribe or nation, seated in the countries above mentioned; and seeming to have possessed the part of the two counties of Warwick and Worcestershire. This nation is called by Tacitus (Ann.I. xii. c. 38.) the Jugatres, by a mis-sake as it is thought of his transcribers, for Wigantes, or Hiner, their real name.

The Wigantes, signifying in the ancient language of Britain, brave men, seem to have been an independent nation under their own prince Venutius, who married the famous Cartesionandus, queen of the Brigantes. But both the Wigantes and Cornavi, were in such firm alliance with the Icenii and Corn-Isen, that they were reduced at the same time, and by the same generals, under the dominion of the Romans. (Tacit. Ann.I. xii. c 29, 30.) That brave and indomitable people built many forts, laticums, and towers in the country of the Cornavi and Wigantes, to keep the inhabitants in subjection.

As the 1st cond journey of Antonius from beyond the wall of Severus to Richborough in Kent, passes through this country from north to south, it will conduct us to several of the Roman towns and laticums. The most northerly of these towns was Condate, supposed to be Northwich in Cheshire. We come next to Diva or Deva, now Chester, which was a city of great importance in the time of the Romans, a colony, and the citadel of the 20th legion. Purining the same route from thence, we meet with the following towns in their order; Boxtown, near Strickon; Melbournus, near Drayton; Rutamium, near Wem; Uriconium, near Wroxeter, the ancient capital of the Cornavi; Ux foria, near Sheriff Hales; Pennoerium, near the river Perk; Erecnum, near Wall near Litchfield; and Mandrefnedon, near Manchester, in Warwickshire. The precise boundaries of the several Roman provinces in Britain are so little known, that we cannot be certain whether the whole country of the Cornavi and Wigantes was within the limits of that which was called Britannia Prima, or some part of it belonged to Britannia Secunda.

CORNAX, MATTHIAS, in Biography, a native of Mel- nola, a small town in Italy, rudited medicine at Venier, where he afterwards continued to practice, and was appointed one of the teachers in the art. He is here noticed, on account of his having published a cafe of a woman who had carried an extra fetus in the abdomen, for the space of five years. An abscess at length forming, near the navel, and burrowing, our practitioner enlarged the aperture, and extracted through the wound, a half putrid fetus. The woman recovered, but becoming again pregnant, and it not being practicable to deliver her by the natural passage, she died.
It does not appear that the body was opened. The case was originally published at Venice in 1550, in 4to, "Historia quinquennis fere geftationis," &c. It was republished in 1564, with other similar cases, in the author's "Enchiridion Medici consultationis apud Egrotos, &c; Basiliz," 8vo. Haller Bib. Ch.

CORNAZZANI, Anthony, an eminent Italian poet, who flourished in the fifteenth century. He was born at Placentia, but resided chiefly in the early part of life at Milan, but after the death of Sforza he was obliged to take refuge at Venice, where he was hospitably received by Bartholomew Colleone, whose life he afterwards wrote. From Venice he went to France, and from thence to Ferrara, where he finally settled under the patronage of Duke Hercules the first, and his duchessa Lucretia Borgia. He is chiefly known by his sonnets and lyric poems, some of which are reckoned the most perfect of their kind in the language. He wrote the lives of the Virgin Mary and of Christ in verse; and among his prose works, we have, besides the life of Colleone, a treatise "De Mulieribus admirandis," and another entitled "De excellensim Vitorum principibus,"

CORNE, or CORNA, in Ancient Geography, a town of Cappadocia, towards the Euphrates, to the south of Melitene.

CORNE, in Geography, an island, ten miles long and one wide, in the gulf of Mexico, near the coast of Florida. N. lat. 30° 11'. W. long. 83° 32'.

CORNE, a town of France, in the department of the Mayne and Loire; 7 miles E. of Angers.

CORNE. See Horn-work.

Corne a amorcer, priming-horn. An ox-horn filled with fine powder for priming cannon.

END OF VOL. IX.